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A Longitudinal Examination of First Term Attrition and Reenlistment Among FY1999 Enlisted Accessions

William J. Strickland, Editor
Human Resources Research Organization

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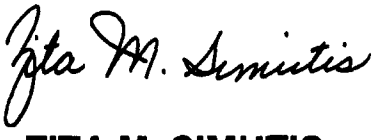

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14. ABSTRACT *(Maximum 200 words)*:

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) developed Project First Term as a multi-year, longitudinal investigation of Soldier attrition and reenlistment among the cohort of recruits who joined the Army in Fiscal Year 1999. This effort allowed the evaluation of models of attrition and reenlistment intentions based on information contained in personnel records and collected from Soldiers who were surveyed as they entered the service, completed training segments, conducted duty assignments and left the service. These models explored reasons for attrition and reenlistment intentions, and suggested management strategies that might be employed to reduce attrition. This report provides a comprehensive description of the Project First Term methodology and analyses, and documents those results that are most relevant to the management of first term attrition.

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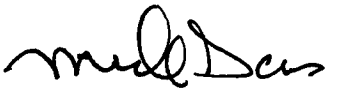
FOREWORD

Management of attrition is an essential component of effective personnel management. The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has on a number of occasions conducted research on various aspects of Soldier attrition. The research reported herein stands out as the first attempt to comprehensively examine throughout the entire first term of enlistment the various factors that influence the process whereby the Soldier remains with the Army or separates.

The initial authorization for this work came from a 1998 directive by the Assistant Secretary of the Army, Manpower and Reserve Affairs (ASA-M&RA) to ARI to initiate a research program to identify correlates and precursors of enlisted first term Soldier attrition to support management efforts designed to lessen such attrition. ASA M&RA sponsorship was subsequently supplemented by Deputy Chief of Staff, Army G-1 sponsorship following a request by the Chief of Staff of the Army to determine why Soldiers exit service from the entry training base.

The findings from this effort include factors associated with attrition at every stage of the Soldier's first term of enlistment, up to a period of 48 months. The Army G-1, the Commanding General, U.S. Army Accessions Command (USAAC), the Deputy Commanding General for Initial Entry Training, and other representatives from G-1 and the Training and Doctrine Command were briefed at various stages of the project, culminating in a presentation of results and recommendations to an Army External Review Panel consisting of representatives from the Enlisted Division, Army G-1, the Office of the Deputy Chief of Staff for Operations and Training, TRADOC, and the Army Accessions Command, TRADOC, on 4 May 2004. Findings have also been presented during a workshop sponsored by the National Academy of Sciences' Committee on the Youth Population and Military Recruitment.

The dissemination of this information to sponsors is but the first step toward insuring that the findings of this effort have a positive impact upon the Army. ARI has initiated a follow-up effort, in which researchers will work with sponsors to refine general recommendations into specific trial implementation efforts that can then be tested and evaluated. This effort begins with a workshop involving sponsor representatives in FY05 in which recommended implementation strategies will be presented and prioritized.



Michelle Sams
Technical Director

ACKNOWLEDGEMENTS

This report reflects the efforts of many individuals and agencies without whom this project could not have been completed. We owe special thanks to the Soldiers in the Fiscal Year 1999 cohort for taking the time to complete these surveys and to give us reasoned, honest answers. In addition, the U.S. Army Training and Doctrine Command (TRADOC) and the U.S. Army Forces Command (FORSCOM) provided critical support that allowed the timely and staggered collection of data from Soldiers at Reception Battalions, during training, while assigned to operational units, and when exiting the service. Those data were critical to the analyses and conclusions reported here.

Within HumRRO, numerous staff members participated in the project. A team from HumRRO's Fort Knox office, under the direction of Ms. Charlotte Campbell, managed the on-site data collection of surveys at nine installations in the United States. Ms. Jessica Terner Durk, Mr. Jeff Barnes, Ms. Shonna Waters, and Ms. Sonia Kim worked wonders under tight time restrictions to get survey responses opened, logged, scanned, checked, and cleaned, and to deliver a quality product. Ms. Winnie Young's support in providing extracts from Army administrative files has been outstanding. Dr. Peter Ramsberger and Dr. W. S. Sellman provided valuable feedback in technical reviews of draft reports for the project. Dr. Sunny Sipes Becker provided scientific guidance during the project's critical conceptual stages, drafted many of the survey questions used throughout the project's life, reported on project results for the first years of data collection, and served as a reviewer for later reports (including this report).

Within the U.S Army Research Institute for the Behavioral and Social Sciences (ARI), support from Ms. Fran Kennedy (who compiled a database of cohort members, their units, and their unit addresses) and Mr. Morris Peterson (who managed the process in ensuring that surveys were properly packaged and distributed) was crucial to the successful fielding of surveys to operational units. We owe special thanks to our Delivery Order Contracting Officer's Representatives (DO-COR)—Dr. Trueman Tremble, Dr. D. Bruce Bell, and Dr. Peter Legree—for guidance and support in all aspects of the project. We also acknowledge the initial guidance provided by our first DO-COR, Dr. Jacqui Mottern (now with Navy Personnel, Research, and Studies—NPRST). In addition, Dr. Michael Rumsey and Dr. Peter Legree provided wisdom and insight regarding project implications.

A LONGITUDINAL EXAMINATION OF FIRST TERM ATTRITION AND REENLISTMENT AMONG FY1999 ENLISTED ACCESSIONS

EXECUTIVE SUMMARY

Research Requirement:

The failure of first-term enlisted Soldiers to complete their obligated term of service (i.e., attrition) is among the Army's most formidable personnel challenges. More than one-third of entering recruits fail to fulfill their initial obligation; half of those who attrit do so within their first year of service. Such early personnel turnover has been a persistent problem for the Army that compounds recruiting pressures and detracts from force readiness. Attrition can also be very costly. For example, a General Accounting Office report to Congress indicated that each recruit who leaves the military costs the Department of Defense (DoD) more than $35,000 (GAO, 1998). Multiply that estimate by one-third of the number of enlisted personnel who enter active duty in any given fiscal year (e.g., if 20,000 of 60,000 recruits that enter annually attrit) and the costs of attrition for a yearly cohort of accessions are in excess of $700,000,000. Other studies have reported even higher cost estimates (e.g., $60,000 per recruit rather than $35,000) (McCloskey, 1999). Furthermore, some have argued that these attrition cost calculations are underestimates because they often fail to include the time, energy, and administrative and legal costs required to finalize an early separation. Some attrition is clearly unavoidable (e.g., training injuries resulting in discharge) and some attrition certainly has an immediate beneficial effect on the Army (e.g., when low-performing recruits or Soldiers are discharged), yet first-term attrition is costly enough that efforts to predict, explain, and reduce it are likely to result in significant savings to the Army.

Procedure:

Given the importance of attrition, it is not surprising that a substantial amount of research has been devoted to studying its antecedents and consequences. The vast majority of this research has (a) examined the validity of demographic and personal characteristics (e.g., race, gender, education) for predicting attrition and (b) used cross-sectional designs, investigating predictor-attrition relations at a specific point in time. In contrast, Project First Term is one of the first comprehensive longitudinal studies of Army personnel attrition. In brief, First-Term is a 6-year research effort that follows enlisted Soldiers from the fiscal year 1999 (FY99) cohort through their first term of service. Data on numerous personal, organizational, and extra-organizational factors have been collected at multiple times during those Soldiers' first-term of service to understand and predict their attrition and reenlistment decisions. As Malcolm Forbes once said, "It's so much easier to suggest solutions when you don't know too much about the problem." One of the primary goals the Army hoped to achieve through Project First Term was to identify promising *content areas* that could underlie (a) future assessments for identifying those at greatest risk of attrition (and *not* reenlisting) and (b) future interventions that the Army might use to reduce attrition and to increase the reenlistment rates of enlisted personnel.

Previous First Term project reports have examined various aspects of continuance intentions and actual attrition. These include the characteristics of incoming accessions, reasons for attrition from the training base, continuance intentions of Soldiers after Initial Entry Training, 12-month attrition and continuance intentions of Soldiers in their initial operational units, predictors of continuance intentions assessed in the third year of service, and in-unit attrition after three years of service. The current report extends previous reports in several ways and may be viewed as a comprehensive capstone for all project reports done to this point.

Findings:

The report describes all the data sources available for the project (including all the surveys administered as part of the project, data elements extracted from Army administrative files, test scores, and information retrieved from Defense Manpower Data Center files). Similarly, the report describes in some detail the manner in which survey items were combined to form composites (describing, for example, which survey items were combined to use as a measure of "Satisfaction with military versus civilian life").

Most of the report is structured around defining the composition of attrition within specific, identifiable periods, and the predictors of attrition for those specific time periods. Those periods include the first 48 months of service overall, plus the individual components of the first term of service—Basic Combat Training, Advanced Individual Training, One-Station Unit Training, and the first operational unit of assignment. In addition to the primary focus on attrition, the report also devotes a chapter to the prediction of reenlistment after completing the first term. Within each chapter, the report defines the sample used to build the models discussed in the chapter, the data available to build those models, and the analyses conducted on the data. Results described in each chapter are generally structured from less complex to more complex models. That is, the first analysis within each chapter looks at the composition of attrition for the time period addressed in the chapter. That discussion is followed by a description of the simple bivariate relationships found to exist in the data. The next analysis involves more complex, multivariate relationships, followed by the exploration of structural models that may explain the relationships that were found. Every chapter ends with a summary of key findings, based on the research questions raised in the chapter.

The report concludes with a chapter specifically addressing recommendations for understanding and managing first-term attrition based on all of the results of the longitudinal investigation of the FY99 accession cohort. A key point to understanding attrition—one that cuts across the chapters of this report—is that the nature of attrition changes across the first term. Specifically, early attrition is due primarily to performance and medical/physical factors. Attrition due to performance and medical/physical concerns accounts for approximately 80% of all attrition in the first 6 months of service. Beyond 6 months, moral character attrition becomes more prevalent (approximately 60% of all attrition occurring between 2 and 3 years of service and nearly 50% of attrition thereafter). Pregnancy/parenthood attrition also increases after 6 months, while performance and medical/physical attrition rapidly decrease. Attrition later on in the unit stems primarily from deviance-related issues. Because the reasons for in-unit attrition change over time, it will not be possible to "shift" *all* attrition forward in time. Simply put, the type of Soldier who attrits in unit is not the same type of Soldier who attrits in IET. Such differences exist, in part, because of the

defining characteristics of the IET and in-unit phases of the first term. Because these characteristics are unlikely to change, it is not a simple matter to "front load" attrition. Therefore, any gains from front-loading attrition would likely need to focus on performance and medical/physical attrition.

Utilization and Dissemination of Findings:

The report then turns to strategies for managing first-term attrition, knowing that its character changes over time. There are several possibilities, involving one or more of the following three actions: (a) identification and screening of high-risk recruits, (b) application of post-enlistment interventions, or (c) implementation of Army-wide programs designed to address antecedents of attrition. Specifically, the report recommends considering combinations of the following approaches:

1. Identify high-risk recruits, and
    a. bar them from enlisting, or
    b. allow them to enter, but require them to meet higher standards on other criteria that might decrease their risk of attrition, or
    c. allow them to enter, but require them to participate in a DEP program designed to reduce their risk of attrition, or
    d. allow them to enter, but require them to participate in the DEP for a mandatory, longer period of time (e.g., a minimum of 3 months)
2. Train supervisors who interact with high-risk Soldiers to help those Soldiers adjust to the demands of the Army.
3. Implement programs across-the-board to address the precursors to attrition. Such programs might address
    a. person-environment fit (values, interests, and expectations)
    b. physical fitness
    c. medical history
    d. homesickness

Successful implementation of attrition management strategies will necessarily involve a combination of these approaches.

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CHAPTER 1: INTRODUCTION

William J. Strickland

THE PROBLEM OF ATTRITION

The failure of first-term enlisted Soldiers to complete their obligated term of service (i.e., attrition) is among the Army's most formidable personnel challenges. More than one-third of entering recruits fail to fulfill their initial obligation; half of those who attrit do so within their first year of service (Laurence, Naughton, & Harris, 1996). Such early personnel turnover has been a persistent problem for the Army that compounds recruiting pressures and detracts from force readiness. Attrition can also be very costly. For example, a General Accounting Office (now named the Government Accountability Office) report to Congress indicated that each recruit who leaves the military costs the Department of Defense (DoD) more than $35,000 (GAO; 1998). Multiply that estimate by one-third of the number of enlisted personnel who enter active duty in any given fiscal year (e.g., if 20,000 of the 60,000 recruits who enter annually attrit) and the costs of attrition for a yearly cohort of accessions exceed 700 million dollars. Other studies have reported even higher cost estimates (e.g., $60,000 per recruit; McCloskey, 1999). Furthermore, some have argued that typical "cost of attrition" calculations are underestimates because they often fail to include the time, energy, and administrative and legal costs required to finalize an early separation (Brose, 1999). Although it is acknowledged that some attrition is unavoidable (e.g., unknown or unpredictable medical conditions) and even beneficial at the time (e.g., when low-performing recruits attrit), first-term attrition is costly enough that efforts to predict, explain, and reduce it are likely to result in significant savings to the Army.

PROJECT FIRST TERM

Given the importance of attrition, it is not surprising that a substantial amount of research has been devoted to studying the antecedents and consequences of military attrition. The vast majority of this research has (a) examined the validity of demographic and personal characteristics (e.g., race, gender, education) for predicting attrition and (b) used cross-sectional designs, investigating predictor-attrition relations at a specific point in time. In contrast, Project First Term is one of the first comprehensive longitudinal studies of Army personnel attrition. In brief, First-Term is a 6-year research effort that follows enlisted Soldiers from the fiscal year 1999 (FY99) cohort through their first term of service (Strickland & Tremble, 1999). Data on numerous personal, organizational, and extra-organizational factors have been collected at multiple times during Soldiers' first-term of service to understand and predict their attrition and reenlistment decisions. One of the primary goals the Army hoped to achieve through Project First Term was to identify promising *content areas* that could underlie (a) future assessments for identifying those at greatest risk of attrition (and *not* reenlisting) and (b) future interventions that the Army might use to reduce attrition and to increase the reenlistment rates of enlisted personnel.

Previous First Term project reports have examined various aspects of continuance intentions and actual attrition. These include the characteristics of incoming accessions (Sipes & Sadacca, 2000), reasons for attrition from the training base (Sipes, Strickland, Laurence, DiFazio, & Wetzel, 2000), continuance intentions of Soldiers after Initial Entry Training (Sipes & Strickland, 2002), 12-month attrition and continuance intentions of Soldiers in their initial

operational units (Sipes, Strickland, & Sun, 2002), predictors of continuance intentions assessed in the third year of service (Van Iddekinge, Strickland, & Sipes, 2003a), and in-unit attrition after three years of service (Van Iddekinge, Strickland, & Sipes, 2003b). The current report extends previous reports in several ways and may be viewed as a comprehensive capstone for all project reports done to this point. Overviews of the purpose of the current report, the data it is based on, and the analysis strategies used are provided below.

THE CURRENT REPORT

Purpose

As noted above, our primary purpose in this report was to identify promising *content areas* that could underlie (a) future assessments for identifying those at greatest risk of attrition (and *not* reenlisting) and (b) future interventions that the Army could use to reduce attrition and to increase the reenlistment rates of enlisted personnel. Given this purpose, we attempted to leverage Project First Term data to address issues of identification (i.e., who attrits?) and understanding (i.e., why do they attrit?) in order to make recommendations regarding content areas that could benefit the Army most by inclusion in future risk assessments or intervention programs. It is very important to note that our purpose was neither to evaluate nor to assess the implications of potential strategies for *dealing with* recruits or Soldiers deemed to be high risk. For example, how exactly should such recruits or Soldiers be handled once they are "tagged" as high attrition risks? How would the Army deal with the potential for stigmatization that recruits might feel by being identified as high risk (e.g., to avoid self-fulfilling prophesies and negative differential treatment by Drill Sergeants)? Although the substantive content of such strategies for managing attrition (e.g., identification through risk assessment and subsequent restrictions on entry or interventions) may be informed by the understanding of attrition and reenlistment gained through this report, the Project First Term data were simply not designed to evaluate implications of such management strategies.

Given our primary purpose, goals for examining attrition and reenlistment in this report followed accordingly. For attrition, our main goals were (a) assessing what first term attrition looks like across time (i.e., gaining a better understanding of our criterion), (b) determining who is most likely to attrit at various times (i.e., who attrits and when do they do it), and (c) understanding why Soldiers attrit when they do (i.e., what factors explain why Soldiers attrit at various times). For reenlistment, the goals were similar, with the exception that issues of time (i.e., with regards to when a Soldier reenlisted) were far less pertinent.

Overview of Data Sources

Project First Term included the development and administration of a series of surveys to the members of the FY99 active Army accession cohort at several points between FY99 and FY02. In addition to survey data, extracts from Defense Manpower Data Center (DMDC) files and the Army's Enlisted Master File (EMF) provided official administrative record data for cohort members. Finally, two special data collection instruments were used during the project—the Assessment of Individual Motivation (AIM) and the Red Phase Performance Record. Each of these data sources is briefly described below. Copies of each survey instrument, a copy of the Red Phase Performance Record, and a list of DMDC and EMF data elements discussed in this

report are in Appendix A. The AIM is a controlled personnel test and is not publicly available; thus, we have not included a copy in the Appendix.

Administrative Data (n=63,938)

Administrative files provided demographic information (e.g., gender, race/ethnicity, education level) as well as official codes (e.g., military occupational specialty [MOS]). DMDC provided the cohort file, which defined the first term cohort of 63,938 FY99 active Army accessions. The U.S. Army Human Resouces Command (formerly Personnel Command) provided quarterly EMF extracts containing snapshots of dynamic attributes, such as education level, marital status, separation dates, and attrition status. EMF extracts in the first-term database are current through March 31, 2003.

Soldier Reception Survey (SRS) (n=29,004)

The SRS is a 61-item self-report questionnaire that was administered in a group setting to enlisted Soldiers during their first week in the active Army (at their reception battalions). The SRS contains two types of items: (a) those designed to assess Soldiers' pre-accession cognitions, attitudes, and beliefs about the Army (e.g., reasons for enlisting, motivation, concerns, attitudes, confidence); and (b) those that assess personal characteristics and background experiences (e.g., school experiences and participation in the Delayed Entry Program [DEP]). This survey was designed as a census instrument, but administrative restrictions limited the respondent pool (Sipes & Sadacca, 2000). Note that some demographic information available in official administrative files was also included in the survey to support early analyses prior to extraction of administrative data. Data contained in official administrative files were used when the two sources of information were inconsistent.

A total of 52,309 Soldier Reception Surveys were administered. These cases included 20,301 respondents (38.8%) who were not active Army and 79 respondents (< 1%) who did not provide a social security number. The remaining respondents were matched by social security number to the DMDC cohort file; an additional 2,488 records (4.8%) were eliminated because they contained social security numbers that failed to match. Finally, 434 records (< 1%) were eliminated because they contained a large number of missing responses (i.e., respondents failed to answer at least seven survey items). The remaining 29,004 matched SRS respondents form the usable sample for subsequent analyses. These respondents represent 45% of the full cohort, and 70% of the 41,262 Soldiers accessed during the survey administration period (January 16, 1999 to August 31, 1999).

Assessment of Individual Motivation (AIM) (n=15,941)

The AIM was developed by the Army Research Institute for the Behavioral and Social Sciences (ARI) as an assessment tool that would provide scores for personality constructs in a way that was resistant to the effects faking and coaching. AIM consists of 27 forced-choice items that provide scores on six constructs: Dependability, Adjustment, Work Orientation, Agreeableness, Leadership, and Physical Conditioning. AIM was administered to over 22,000 recruits entering the Army between September 1998 and May 1999. (Recruits who took the AIM in September 1998 were not members of the FY99 accession cohort; their data is not part of the

Project First Term dataset.) Further information about the AIM can be found in Knapp, Heggestad, and Young (2004).

End-of-Training Survey (EOTS) (n=39,265)

The EOTS is a 55-item instrument that captured self-report information from Soldiers as they completed Basic Combat Training (n=22,015), Advanced Individual Training (n=10,382), and One-Station Unit Training (n=6,868). Surveys were administered in a group session during the final week of training. The same survey was used for all three phases. This survey was administered at all BCT and OSUT installations and at a sample of AIT installations (Strickland & Tremble, 1999).

Over 70,000 EOT surveys were administered. After eliminating surveys completed by respondents not in the research cohort (e.g., National Guard, Reserve, missing social security numbers) and duplicate social security numbers, 22,015 BCT surveys, 10,382 AIT surveys, and 6,868 OSUT surveys were identified as usable. A total of 33,169 Soldiers in the FY99 cohort—51.8%—completed one or more EOT surveys. (Soldiers who participated in BCT and AIT had the opportunity to complete the survey at two times.) The EOTS was administered from April 1999 through December 1999.

Annual First-Term Survey 2001 (AS01) (n=16,026)

The AS01 provided a snapshot of Soldiers' attitudes, experiences, and impressions, including Army career intentions, as of spring 2001. Many of the items included in the SRS and EOTS were repeated in the AS01 to facilitate analysis of change over time. We intended to provide a survey to every member of the FY99 cohort who was still in the Army as of March 1, 2001 (n=48,325). The surveys were packaged by company-level unit and mailed to the unit commander, along with a description of the project, a roster of Soldiers in that unit who were members of the cohort, and instructions for distributing and returning the surveys. Commanders were to distribute surveys to the identified cohort members, collect surveys—in sealed envelopes—from those Soldiers, package up all their unit's returns, and mail that package back to ARI. Three weeks after mailing the surveys, we sent a follow-up reminder letter, signed by the U.S. Army Deputy Chief of Staff for Personnel, G1, to those unit commanders who had not responded. We eventually received survey packets back from 1,496 of the 3,610 unit commanders who had FY99 cohort Soldiers assigned to their units (41.4%). The overall response rate at the Soldier level was 33.2% (16,026 usable surveys returned out of 48,325 active cohort members).

Annual First-Term Survey 2002 (AS02) (n=14,351)

The AS02 was a 49-item survey that assessed Soldier attitudes, experiences, and impressions, including Army career intentions, as of spring 2002. Most AS01 items also appeared in the AS02 to facilitate analysis of change over time. Our intention was to provide a survey to every member of the FY99 cohort still in the Army as of March 31, 2002 (n=39,492).

In an attempt to increase the return rate, surveys were distributed using two procedures. Surveys for those cohort members stationed at nine high-population installations in the United

States were delivered in person to designated unit points of contact. They, in turn, distributed the surveys to the appropriate members of their unit, with a specified date several days later for their return. Although Soldiers were required to receive and return the surveys, they were not required to actually fill them out. To protect privacy, Soldiers returned their surveys in sealed envelopes to the unit points of contact. Only members of the research team had access to completed surveys. For cohort members assigned to all other installations worldwide, surveys were administered using the same process developed for the AS01. Surveys were packaged by company-level unit and mailed to the unit commander, along with a description of the project, a roster of Soldiers in that unit who were members of the cohort, and instructions for distributing and returning the surveys. Commanders were to distribute surveys to the identified cohort members, collect surveys (in sealed envelopes) from those Soldiers, package up all their unit's returns, and mail that package back to ARI. One month after the initial mailing, we sent a follow-up reminder letter, signed by the U.S. Army Deputy Chief of Staff for Personnel, G1, to those unit commanders who had not responded. We eventually received survey packets back from 886 of the 2,337 unit commanders who had FY99 cohort Soldiers assigned to their units (37.9%). The overall response rate at the Soldier level across both survey distribution methods was 36.3% (14,351 usable surveys returned out of 39,492 active cohort members).

Exit Survey (n=4,360)

The Exit Survey provided an opportunity to reach beyond the official separation codes included in administrative records and flesh out why a Soldier exited service prematurely—from the Soldier's point of view. Respondents were asked to explain their reasons for leaving in two ways: by selecting reasons from a list, and by completing, in their own words, an open-ended item explaining why they were leaving. In addition, respondents were asked what actions the Army might have taken that would have prevented their attrition. The Exit Survey was administered at the same locations where the SRS and EOTS were administered, from mid-April 1999 through December 1999. During that time, surveys were completed by 64% of all departing cohort members. The survey was administered by the local Army Transition Center as part of the routine paperwork that Soldiers must complete as they leave the Army. A total of 7,460 surveys were administered; 4,360 of these were matched successfully to the cohort file.

BCT Red Phase Ratings (n=2,188)

Information was collected on the BCT performance of a subset of FY99 cohort Soldiers. Training records were requested for all active Army Soldiers who completed the Red Phase of BCT during August 1999 at Fort Jackson and Fort Benning. Information on physical fitness scores and Drill Sergeant's ratings of Soldiers on the seven Army core values were extracted from these files. A total of 3,578 records were processed; 2,188 records could be matched with cohort members.

Figure 1.1 depicts the time period for administration of each survey. Table 1.1 below summarizes the number of Soldiers for whom each data source was available. Appendix B includes a more complete description of the frequency or mathing records across data sources.

	Oct-Dec 98	Jan–Mar 99	Apr–Jun 99	Jul–Sep 99	Oct-Dec 99	Jan-Mar 00	Apr-Jun 00	Jul-Sep 00	Oct-Dec 00	Jan 01-Mar 01	Apr 01-Jun 01	Jul 01-Feb 02	Mar 02-Sep 02
DMDC													
EMF													
SRS													
EOTS													
AIM													
Exit Survey													
BCT Red Phase													
AS01													
AS02													

Figure 1.1. Timeline for Project First Term Data Collection

Table 1.1. First Term Data Sources

Source	Number of Soldiers
Administrative Files	
DMDC Cohort File	63,938
Enlisted Master File (EMF) through 03/03	63,938
Training Records	
BCT Red Phase ratings	2,188
Surveys	
Soldier Reception Survey (SRS)	29,004
Assessment of Individual Motivation (AIM)	15,941
End-of-Training Survey (EOTS)—BCT	22,015
EOTS—AIT	10,382
EOTS—OSUT	6,868
Exit Survey	4,360
Annual Survey—2001 (AS01)	16,026
Annual Survey—2002 (AS02)	14,351

A Note on the Attrition Criterion

Throughout this report, we rely on administrative documentation to determine which Soldiers left the Army, when they left, and the circumstances surrounding their departure. We have high confidence in the record data regarding who left the Army and when they left. Significant issues can be raised, however, regarding the documentation of the circumstances leading to a Soldier's departure. Throughout this report, we use the Interservice Separation Code (ISC) as the single determinant of "type" of attrition. These codes, described more fully in Chapter 2, were established through years of use and negotiation across all military Services; they are designed to provide a single, unambiguous reason for every Soldier's departure from the

Army. In some instances, that reason may be accepted at face value (e.g., expiration of contracted term of service, acceptance into an officer commissioning program, retirement for length of service, death). Reasons for attrition that are of most concern to us, however, result from complex situations that the ISCs might not capture adequately. For example, an ISC that indicates that a Soldier left the Army because of "medical conditions existing prior to service" does not preclude a role for behavioral or adjustment problems as part of the decision process leading up to that Soldier's discharge. Similarly, a discharge for "unsatisfactory performance" as captured by an ISC does not preclude a role for physical fitness or weight or medical or adjustment problems in the discharge decision.

Because it was widely suspected that using a single ISC to categorize attrition might be inadequate, in Project First Term we investigated alternate sources for attrition information. As noted in the Overview of Data Sources discussion above, we administered an Exit Survey to 4,360 cohort members who left the Army during IET. This survey provided us with the (possibly self-serving) perspective of the Soldier being discharged. In addition to the Exit Survey, we retrieved the separation folders (i.e., paper records) for all Soldiers who left the Army in 1999. From those, we were able to identify the records of 6,092 FY99 cohort members. While each Soldier is assigned only one ISC, separation folders provide us with much more information about the reasons for each Soldier's discharge. We coded up to 25 reasons for discharge for each Soldier based on separation folders and up to 23 reasons for discharge for each Soldier based on Exit Survey responses. We were ultimately able to identify 2,663 Soldiers for whom we had an ISC, an Exit Survey, and a separation folder. Sipes, Strickland, Laurence, DiFazio, and Wetzel (2000) documented the analyses of these multiple sources for attrition reasons. They concluded that

> The various data sources provided largely similar reasons for separation. The notable exception was the preponderance of self-reported dissatisfaction indicated by many attritees with medical discharges. This may indicate that medical discharges are sought out by individuals seeking escape from their Army obligation. Separation folder analyses support the "voluntary" nature of attrition; the entries (or lack thereof) suggest that Soldiers want the discharge (p. 54).

In the analysis chapters that follow, we distinguish "types" of attrition based on assigned ISCs. There is no doubt that factors in addition to those represented by the assigned ISC are involved in most discharges. At the same time, ISCs provide a convenient standard for categorizing attrition at a gross level, and the results of the modeling efforts discussed in Chapters 3 through 8 make conceptual sense based upon ISCs.

Overview of Analysis Strategy

The magnitude of the Project First Term database in terms of breadth of variables ($k >$ 1,000) available to model attrition and re-enlistment decisions among the FY99 cohort is arguably unparalleled in the history of research on first-term attrition and reenlistment in the Army. As such, formulating a plan for analyzing such data was a formidable challenge. The goals that we set out to achieve in the current report (described above) helped drive our analysis strategy. At the root of this plan was a set of four basic research questions:

1. How can first-term attrition be characterized?

2. Which variables have the strongest bivariate relationships with first-term attrition and re-enlistment?

3. How well can multivariate models predict first-term attrition and reenlistment and, thereby, identify those individuals at greatest risk for these events?

4. Can structural models of first-term attrition and reenlistment elucidate the mechanisms by which the most salient predictors of these events function?

On the surface, these questions appear relatively straightforward. However, answers to these questions depend on how one defines their essential aspects. For example:

- Attrition that occurs when?
  - During Basic Combat Training (BCT), Advanced Individual Training (AIT), One-Station Unit Training (OSUT), or in-unit?
- Attrition of what type?
  - For example, attrition linked to interservice separation codes (ISCs) related to medical issues, or attrition linked to ISCs related to moral character issues?
- Variables captured when?
  - At enlistment, immediately prior to entering training, immediately prior to entering one's unit, or while in unit?

Modeling Attrition

Our strategy for modeling attrition focused on all attrition that occurred through 48 months of service. The focus of our analysis efforts was on attrition that occurred during four major phases of a Soldier's first term of service, specifically:

- Basic Combat Training (BCT)
- Advanced Individual Training (AIT)
- One-Station Unit Training (OSUT)
- In-Unit

We devote a separate chapter of this report to examining attrition occurring in each of these phases; before that, however, we define in Chapter 2 how attrition was coded for the analyses conducted in each chapter, as well as how the samples examined in these chapters were defined (e.g., the Soldiers included in the analyses). In Chapter 3, we open our examination of attrition with a general look at attrition across all 48 months of service.

For each attrition chapter, we focus only on those predictor variables that were captured before the time period of interest in the chapter (i.e., before Soldiers were at risk for attrition in the given time period). Thus, for BCT and OSUT, we only examined variables captured before the start of training—specifically, Administrative, SRS, and AIM data (subsequently referred to as "pre-training" data). For AIT, we examined pre-training data, plus data captured during BCT (Red Phase) and immediately after completing BCT (EOTS-B). For in-unit attrition analyses, we

examined all data captured from Soldiers before joining their unit (i.e., SRS, AIM, Administrative, Red Phase and EOTS). We also examined in-unit attrition that occurred after administration of the ASO1 and ASO2.

We focus only on data available before a Soldier's entry into a given phase of service for two reasons. First, if we had decided to use data that became available *after* a Soldier had already entered a given phase to predict attrition during that phase it would have necessitated that all Soldiers remained in service until they completed the given survey. As such, the attrition rate among Soldiers completing the given survey prior to completing it would necessarily be zero (e.g., all Soldiers completing EOTS-A completed AIT, thus using EOTS-A data to predict AIT attrition would have been meaningless). Indeed, this is why we did not use AS01 or AS02 data in most of our attrition analyses (though it was used to model reenlistment and in the second half of the unit attrition chapter). For example, Soldiers with AS02 data would have necessarily survived IET and at least some of their time in unit; thus, there would be no variation in IET attrition for AS02 respondents and any variation in in-unit attrition would only reflect variation after survey completion (i.e., in-unit attrition among AS02 survey completers prior to the survey was non-existent).

Second, using data that became available after a Soldier had entered a time period would also have little practical utility to the Army in any attempts to reduce attrition during that phase. Specifically, the Army would need to identify Soldiers before they enter a phase in order to have the time to take steps to prevent attrition during that phase. If the Army waited until after a Soldier had already entered a given phase, the Soldier would already be at risk for attrition. Thus, we wanted to focus on data that might allow the Army to take pre-emptive action.

To address each of the general research questions above, the first step we took was to attempt to reduce the vast amount of data that was available through each of the First Term surveys described above. This was done to eliminate redundancies in surveys and build reliable measures of key predictor constructs (e.g., job satisfaction, commitment). The process used to form survey composites is thoroughly described in Chapter 2. The survey composites described in Chapter 2, along with administrative data from DMDC and EMF (described above), and individual survey items that did not appear in composites served as our primary set of predictors for the substantive analysis chapters of this report (Chapters 3 through 8).

For each attrition chapter (Chapters 3 through 7), a similar analysis strategy was followed. We first examined bivariate relationships between predictor variables examined in the given chapter and all attrition criteria created for that time period. In our analyses we differentiated between all attrition that occurred in the given time period and different types of attrition as defined by ISCs. Coding for the types of attrition examined is discussed in Chapter 2. Next, we assessed whether the bivariate relationships between predictors and attrition during the chapter's focal time period varied by time. For example in the overall sample, we assessed whether relationships between predictors and attrition varied across the first 48 months of service. For the in-unit sample, we assessed whether relationships between predictors and attrition varied as a function of Soldiers' month in unit. For the most part, we also assessed the potential for time varying effects using event history analyses (EHA) that employed discrete time hazard models (Singer & Willet, 2003). Details on how the EHA analyses were performed are provided in Chapter 3.

Next, we formed multivariate models of attrition for each phase of service. The purpose of fitting these models was to (a) assess how well we could predict attrition using variables available before the given phase and (b) determine what variables emerged as the most salient predictors of attrition in that phase controlling for the effects of other variables. Finally, we constructed structural models of attrition in each phase of service. The primary purpose of fitting these models was to understand the mechanisms by which the most salient predictors of attrition during these phases function. A secondary purpose was to clarify the role that historically salient demographic variables play in accounting for first-term attrition (e.g., determining whether the effects of gender and education tier are direct or indirect).

Modeling Re-Enlistment

Project First-Term was designed to explore not only first-term attrition but also reenlistment intentions and actual behaviors at the end of the first term. Chapter 8 differs from earlier chapters by focusing on first-term reenlistment. In conducting that examination, however, we used essentially the same strategy for reenlistment that we used for attrition. First, we examined factors predicting Soldiers' reenlistment in each survey separately (i.e., SRS, EOTS-BCT, EOTS-AIT/OSUT, AS01, and AS02). Logistic regression was used in these analyses. We then combined predictors across multiple surveys (time periods) to create new prediction models. Results of these analyses provided piecemeal information about the relationships among the variables influencing Soldiers' reenlistment decisions across time. As a last step, we attempted to integrate those findings to build a longitudinal model specifying relationships between determinants of reenlistment behavior. Additional regression analyses were carried out to determine additional variables to be included in the more distal parts of the model (i.e., predictors of continuance intention).

Summary and Implications

Each chapter concludes with a summary of the research questions addressed in the chapter and a discussion of the results presented in that chapter. Chapter 9 provides an overall summary and discussion of Project First-Term's findings and the implications of those findings. It is important to note that significant events have occurred between the time that members of the FY99 cohort reported for Basic Military Training and the completion of their first terms of service. Soldiers entering the Army today face the almost certain prospect of deployment to a hostile environment. Thus, the recruiting environment has changed, and it is possible that the models developed for the FY99 cohort will be less applicable to more current cohorts. Anticipating that problem, ARI replicated the First-Term data collection strategy with the Fiscal Year 2003 accession cohort. Putka and Strickland (2004) concluded that

> The results presented in this report suggest that the FY03 and FY99 cohorts are quite similar. Though some differences were found, they did little to diminish the predictive validity and utility of variables and models identified as salient predictors of BCT attrition in the FY99 longitudinal investigation. In light of these findings, recommendations made based on the FY99 cohort's longitudinal examination with regard to how the Army can use these results to manage BCT attrition still hold (p. 33).

CHAPTER 2: SURVEY COMPOSITE DEVELOPMENT AND CODING OF CRITERIA

Chad H. Van Iddekinge and Dan J. Putka

OVERVIEW

In this chapter, we describe (a) the development of the survey composites used in this research, and (b) the coding of attrition and reenlistment criterion variables. We begin by discussing the process used to develop the predictor composites for each Project First Term survey. We then discuss how we formed attrition and reenlistment criteria.

COMPOSITE DEVELOPMENT

Development Process

The following is a brief description of the process we used to develop the survey composites for this investigation. We began by identifying sets of items within each survey that theory and previous Project First Term research suggest measure the same construct. We then used factor analysis to evaluate the dimensionality of potential composites that included enough items (usually four or more) to make the results of such analyses meaningful. Maximum likelihood exploratory factor analysis with oblique rotation of factors (promax) was used in all instances.[1] Next, we calculated internal consistency reliability estimates (alpha) and item deletion statistics for the resulting factor(s). In general, we used the common rule-of-thumb of .70 (Nunally, 1978) as a minimum coefficient alpha for creating a composite. However, we also considered the number and scoring of items in our decision-making. For example, we created several composites with reliability estimates less than .70 because they included only a few items and/or consisted of dichotomously scored items.

We did not use internal consistency reliability as a criterion for composites of items that we considered "indicators" or "formative measures" of a given construct (Edwards & Bagozzi, 2000). For instance, one survey question asked respondents to indicate whether each of six reasons made them unsure about an Army career (e.g., lack of experience, changes in Army mission). Although the individual yes/no responses to these questions were not highly related, together we felt they indicated how uncertain respondents were about the Army. Thus, we created a formative measure of the uncertainty construct by summing the number of reasons for uncertainty each respondent endorsed.

Once an initial set of composites was created for a given survey, we computed zero-order correlations between each composite and survey items not included in a composite. Items with notable correlations with one or more composites were evaluated for potential inclusion in those composites. For example, we examined changes in factor structure, internal consistency, and interpretability when the item(s) was added to a composite. We then performed a principal components analysis of the remaining single survey items to identify potential additional

[1] Oblique rotation of factors was used because we expected (based on theory and prior research) the factors emerging from these analyses would be correlated rather than orthogonal.

composites. As a final step, we factor-analyzed the survey composites to determine whether there were any that loaded together strongly enough to warrant aggregation. Also, if new composites were identified in a subsequent survey, we evaluated the adequacy of the same composite in previously examined surveys that included the relevant items.

Results

A total of 145 survey composites were developed using the process described above. Table 2.1 presents the composites developed for each survey. Many of the composites appeared to measure constructs that have been shown to predict civilian turnover, such as attrition cognitions, job satisfaction, commitment, perceived fit, and comparison of alternatives (i.e., military vs. civilian work). Other composites assessed attitudes and beliefs specific to the Army, such as reasons for enlisting, physical fitness, satisfaction with training, and perceived importance of core Army values. In general, the composites had acceptable reliability and differentiated among respondents. We should note, however, that some composites might not have adequately measured the construct of interest. For example, numerous composites included only 2-3 items, and the relatively high internal consistency estimates for these scales is likely due to item similarity. To the extent that such composites (e.g., Attrition Cognitions) are intended to reflect multidimensional constructs, readers should be cautious when interpreting relations between such composites and attrition.

Below are descriptions of the composites created within each survey. For each survey, we provide a table that includes the number of items, the scale on which items were rated (e.g., "5" indicates a 5-point scale that ranged from 1 to 5), the mean (*M*), standard deviation (*SD*), skewness coefficient (Skew),[2] and reliability estimate (α).

Soldier Reception Survey

The Soldier Reception Survey (SRS) contained 61 questions and 212 total items. Analysis of the data resulted in 27 composites that represented 151 items. Table 2.2 displays the descriptive statistics and reliability estimates for each composite. Descriptions of each composite are provided below.

Affective Commitment

The Affective Commitment composite included three items (44a, 44e, and 44f) that assess emotional attachment to the Army (e.g., "I feel a strong sense of belonging to the Army"). The coefficient alpha for this composite was .83.

Attrition Cognitions

The Attrition Cognitions composite included three items (46b, 55, and 56) that assess Soldiers' thoughts and attitudes about their decision to enlist in the Army (e.g., changes in commitment to an Army career since enlisting). The coefficient alpha for this composite was .74.

[2] As a rule-of-thumb, variables that have skewness coefficients with an absolute value less than 1.0 are generally considered normally distributed (Tabachnick & Fidell, 2001).

Table 2.1. Composites that Appear in each Survey

	Survey						
Composite	SRS	BCT	EOT-BCT	EOT-AIT	AS01	AS02	Exit
Affective Commitment	X		X	X	X	X	
Army Physical Fitness Test (APFT)							
APFT 1		X					
APFT 2		X					
Physical Fitness (APFT 1 - APFT 2)		X					
Army Values, Motivation, and Discipline		X					
Attrition Cognitions	X						
Continuance Commitment	X				X	X	
Continuance Intentions	X		X	X	X	X	
Deployment Activity					X	X	
Generalized Self Efficacy	X		X	X	X	X	
Importance of Core Army Values							
Duty, Integrity, and Personal Courage	X		X	X	X	X	
Loyalty and Selfless Service	X		X	X	X	X	
Incidents of Discrimination			X	X			
Job Performance (self-rated)			X	X	X	X	
Military versus Civilian Life							
Benefits			X	X	X	X	
Job Characteristics			X	X			
Pay	X		X	X	X	X	
Quality of the Organization					X	X	
Quality of Work Life	X						
Time for a Personal Life	X		X	X	X	X	
Overall	X		X	X	X	X	
Participation in DEP Activities	X						
Participation in High School Activities	X						
Perceived Fit with Army			X	X	X	X	
Perceived Procedural Justice					X	X	
Physical Fitness			X	X	X		
Possible Reasons for Leaving Army							
Deviance	X				X	X	
Discrimination	X		X	X			
Medical Issues			X	X			
Problems Adjusting	X		X	X			
All Reasons	X		X	X	X	X	
Problems in Unit							
All Problems						X	
Low Commitment						X	

Table 2.1 (Continued)

Composite	SRS	BCT	EOT-BCT	EOT-AIT	AS01	AS02	Exit
Reasons for Joining Army							
Escape Problems	X						
Family/Friends Influence	X						
Job Benefits	X						
Opportunity to Travel	X						
Personal Growth	X						
Training and Experience	X						
Reasons for Leaving Army							
Deviance							X
Discrimination							X
Physical/Medical Problems							X
Problems Adjusting							X
Problems with Supervision							X
Reasons for Quitting Previous Jobs	X						
Satisfaction							
Army Life			X	X	X	X	
Army Medical Care					X	X	
Army Recreational Services					X	X	
Army Services for Families					X	X	
Coworkers					X	X	
Officers			X	X			
Opportunities for Travel and Education					X	X	
Supervision							
Leader Expectations					X	X	
Leader Self-Promotion			X	X			
Leader Support			X	X	X	X	
Training			X	X	X	X	X
Work Itself					X	X	
Work-Family Balance			X	X	X	X	
Thoughts of Quitting High School	X						
Trouble in School	X						
Unsure about Army Career	X		X	X			
Workload						X	

Note. The Possible Reasons for Leaving Army composites represent reasons why Soldiers *might* leave the Army, whereas the Reasons for Leaving Army composites (from the Exit Survey) represent actual reasons why Soldiers left.

Table 2.2. Soldier Reception Survey (SRS) Composites

Composite	Items	Scale	*M*	*SD*	Skew	α
Affective Commitment	3	1-5	3.40	0.92	-0.41	.83
Attrition Cognitions	3	1-5	3.93	0.84	-1.16	.74
Continuance Commitment	5	1-5	3.22	0.95	-0.28	.78
Continuance Intentions	2	1-6, 1-9	6.30	4.45	0.96	.86
Generalized Self Efficacy	4	1-5	4.09	0.88	-1.04	.89
Importance of Core Army Values						
Duty, Integrity, and Personal Courage	10	1-7	6.07	1.00	-1.81	.92
Loyalty and Selfless Service	4	1-7	5.46	1.36	-1.02	.85
Military versus Civilian Life						
Pay	2	1-5	3.54	1.19	-0.58	.82
Quality of Work Life	8	1-5	4.25	0.67	-1.54	.84
Time for Personal Life	4	1-5	2.73	1.08	0.34	.82
Overall	14	1-5	3.73	0.70	-0.53	.88
Participation in DEP Activities	3	1-4(2), 0-1	0.62	0.46	-0.15	.86
Participation in High School Activities*	4	1-3	2.42	1.71	0.65	.50
Possible Reasons for Leaving Army						
Deviance	4	0-1	0.08	0.19	2.96	.66
Discrimination	3	0-1	0.06	0.20	3.49	.74
Problems Adjusting	3	0-1	0.23	0.32	1.18	.64
All Reasons*	18	0-1	2.83	2.84	1.66	.77
Reasons for Joining Army						
Escape Problems	3	1-5	1.62	0.85	1.62	.65
Family/Friends Influence	2	1-5	2.12	1.09	0.77	.69
Job Benefits	6	1-5	3.43	0.86	-0.38	.79
Opportunity to Travel	2	1-5	3.59	1.13	-0.54	.72
Personal Growth	5	1-5	3.34	0.95	-0.31	.74
Training and Experience	2	1-5	3.94	1.07	-0.97	.81
Reasons for Quitting Previous Jobs*	12	1-2	2.68	1.80	0.80	.48
Thoughts of Quitting High School*	11	1-2	0.60	1.20	2.65	.68
Trouble in High School*	8	1-2	1.88	2.07	1.27	.77
Unsure about Army Career*	6	1-2	0.96	1.07	1.37	.44

Note. Listwise N = 27,480. Items = number of items comprising each composite. Scale = numeric scale on which items within each composite were rated. M = mean. SD = standard deviation. Skew = skewness coefficient. α = internal consistency reliability estimate (alpha). *Composite was calculated by summing the number of items endorsed by each respondent.

Continuance Commitment

The Continuance Commitment composite consisted of five items (44b, 44c, 44d, 44g, and 49) that assess the extent to which Soldiers remain in the Army because they lack good alternatives. Factor analysis of these items revealed one main factor that accounted for 53.0% of the variance. The coefficient alpha for this composite was .78.

Continuance Intentions

The Continuance Intentions composite included two items (Questions 50 and 51) about how long Soldiers plan to remain in the Army (e.g., expected years of active duty service). The coefficient alpha for this composite was .86.

Generalized Self Efficacy

The Generalized Self Efficacy composite consisted of four items (46a, 46c, 46d, and 46e) that assess confidence in various areas of Army life, including maintaining physical fitness, having skills to perform well, and earning promotions. Factor analysis of these items revealed one main factor that accounted for 74.6% of the variance in responses. The coefficient alpha for this composite was .89.

Importance of Core Army Values

In the SRS, respondents were asked to evaluate the importance of several core Army values. Factor analysis of the 14 items produced two factors that accounted for 63.0% of the variance. The first factor, Duty, Integrity, and Personal Courage, included 10 items (9b, 9f, 9g, 9h, 9i, 9j, 9k, 9l, 9n, and 9m) that assess the importance of individual values (e.g., personal responsibility). The second factor, Loyalty and Selfless Service, included four items (9a, 9c, 9d, and 9e) about loyalty to people/entities beyond one's own self interests (e.g., unit, the Army). The coefficients alpha for the two composites were .92 and .85, respectively.

Military versus Civilian Life

In Question 45 of the SRS, respondents were asked to compare military and civilian life on several dimensions. Factor analysis of the 14 items revealed three main factors that explained 60.0% of the variance. The first factor, Quality of Work Life, consisted of eight items (45b, 45c, 45d, 45e, 45f, 45g, 45k, and 45m) that assess the quality of life the military offers versus the quality of life Soldiers would have in a civilian occupation (e.g., opportunities for job satisfaction, quality of coworkers, job security). The second factor, Time for Personal Life, consisted of four items (45h, 45i, 45j, and 45l) that assess the time for personal and family life that military and civilian occupations provide. The third factor, Pay, included two items (45a and 45n) that asked respondents to compare the income of military and civilian jobs. We also created an overall military versus civilian composite that contained all 14 items. The coefficients alpha for the resulting composites were .82, .84, .82, and .88, respectively.

Participation in DEP Activities

The Participation in DEP Activities composite comprised three items (6, 7, 8a) that assess how actively Soldiers participated in the Delayed Entry Program (DEP). The coefficient alpha for this composite was .86.

Participation in High School Activities

SRS Question 26 asked respondents to indicate whether they participated in four high school activities (e.g., drama, athletic teams), and if so, whether they were a leader or just a participant. We summed the ratings for each activity to create a composite called Participation in High School Activities. The coefficient alpha for this composite was .50.

Possible Reasons for Leaving the Army

This set of composites originated from SRS Question 57, which asked Soldiers to indicate how likely they would be to leave the Army (in the next 6 months) for each of 18 reasons (i.e., the reason was *not likely to apply* or *likely to apply*). Factor analysis of these dichotomously scored items produced three main factors that accounted for 39.4% of the variance. The first factor, Deviance, consisted of four items (57e, 57j, 57q, and 57r) that assess leaving the Army for disciplinary reasons (e.g., one or more serious offenses). The second factor is called Discrimination and consisted of three items (57k, 57l, and 57p) that assess various types of discrimination (e.g., racial discrimination). The third factor, Problems Adjusting, included three items (57b, 57h, and 57i) about failing to adjust to Army life (e.g., being homesick). The remaining five items did not load highly on any of these factors, and therefore were analyzed individually. However, we developed a composite, All Reasons, that included all 18 items from this survey question. The coefficients alpha for these composites were .66, .74, .64, and .77, respectively.

Reasons for Joining Army

Survey respondents were asked to rate the relative importance of 27 reasons for joining the Army. Factor analysis of these items revealed six main factors, which explained 53.0% of the variance in ratings. The first factor, Job Benefits, consisted of six items (1e, 1f, 1g, 1l, 1o, and 1p) that assess the importance of various benefits Army jobs can offer (e.g., pay and allowances). The second factor, Personal Growth, included five items (1d, 1n, 1t, 1v, and 1w) that deal with joining the Army to grow as a person (e.g., become more self-disciplined). The third factor, Escape Problems, included three items (1h, 1y, and 1z) in which Soldiers were asked to rate whether they joined the Army to escape certain personal problems (e.g., a bad neighborhood). The fourth factor is called Family/Friend Influence and consisted of two items (1i and 1j) that measure the degree to which friends and family were influential in the decision to join the Army. Factor five, Opportunity to Travel, included two items (1r and 1aa) that assess joining the Army for travel and adventure. The final factor, Training and Experience, consisted of two items (1q and 1x) that assess joining the Army to gain job training and experience. The coefficients alpha for the resulting composites were .72, .74, .64, .69, .72, and .81, respectively. The remaining seven reasons for joining the Army did not load on any of the above factors, and thus were analyzed individually.

Reasons for Quitting Previous Jobs

In Question 38, Soldiers were asked whether they had quit a previous job for each of 12 reasons (e.g., was laid off, found a better job, was arrested). Reasons for Quitting Previous Jobs

was created by summing the number of reasons each Soldier selected. The coefficient alpha for this composite was .48.

Thoughts of Quitting High School

SRS Question 25 asked respondents to identify whether they had thought about quitting high school for each of 11 reasons (e.g., expelled or suspended, rules were too strict, wanted to work full time). We summed the number of reasons each respondent selected to create a composite called Thoughts of Quitting High School, which had a coefficient alpha of .68.

Trouble in High School

In Question 22, respondents were asked whether they had gotten into trouble in high school for each of eight reasons (e.g., missing classes, fighting, talking back to teachers). We created a composite called Trouble in School by summing the number of reasons each respondent selected. The coefficient alpha for this composite was .77.

Unsure about Army Career

SRS Question 54 asked respondents to indicate whether each of six reasons caused them to feel unsure about a career in the Army (e.g., lack of Army experience, unclear career goals). The Unsure about Army Career composite was created by summing the number of reasons for uncertainty each respondent indicated. Because Soldiers' responses to Question 54 were viewed as formative measures of the uncertainty construct, it is not meaningful to report a coefficient alpha for this composite.

Basic Training-Red Phase Composites

At the same time these Soldiers were in Basic Combat Training (BCT), their physical fitness was evaluated in the first and third week of BCT (i.e., during the Red Phase). Drill sergeants also provide performance ratings at the end of this period. Table 2.3 displays the descriptive statistics and reliability estimates for the four Basic Training performance composites (28 total items) used in this research. A description of each composite is shown below.

Army Physical Fitness Test Composites

The Army Physical Fitness Test (APFT) composites are based on scores from three subtests: push-ups, sit-ups, and running[3]. Soldiers completed the APFT during the first week of the Red Phase (APFT 1) and again in Week 3 (APFT 2). Both composites are based on the sum of scores across the three subtests. The Physical Fitness composite assesses the change in fitness during these periods (i.e., APFT2 score - APFT 1 score). The coefficients alpha for the APFT composites were .64 and .66, respectively. The reliability of the change score on which the Physical Fitness composite is based was .37.

[3] Please note that the Army created these composites.

Table 2.3. Basic Training-Red Phase Composites

Composite	Items	Scale	*M*	*SD*	Skew	α
APFT 1	3	0-286	136.34	53.67	0.01	.64
APFT 2	3	0-300	184.95	51.89	-0.52	.66
Physical Fitness	6	-219-210	50.21	37.64	-0.58	.37
Army Values, Motivation, and Discipline	16	1-4	2.42	0.62	0.02	.99

Note. Listwise N = 1,802. APFT = Army Physical Fitness Test. APFT 1 was administered at the beginning of Basic Training and APFT 2 was given in the third week of Basic Training. Physical Fitness = APFT 2 - APFT 1. Scale values for the three fitness composites represent the range of scores in the sample. The alpha for Physical Fitness is the reliability of the change score on which the composite is based.

Army Values, Motivation, and Discipline

At the end of the Red Phase, drill sergeants rate the extent to which new Soldiers (a) displayed the core Army values (e.g., loyalty, integrity) and (b) were motivated and disciplined (e.g., personal appearance, follows orders and directions). Factor analysis of the 15 ratings from the two scales revealed one factor that accounted for 89.1% of the variance. Thus, item ratings were combined into a single composite called Army Values, Motivation, and Discipline, which had a coefficient alpha of .99.

End-of-Training Survey (End of BCT)

A total of 55 questions (177 items) comprised the End-of-Training Survey (EOTS), which was administered to Soldiers upon completion of BCT. Analysis of the data resulted in 25 composites that represented 137 items. Table 2.4 displays the descriptive statistics and reliability estimates for these composites. Descriptions of each composite are provided below.

Affective Commitment

Question 15 of the EOTS included six items (15d, 15g, 15h, 15k, 15l, and 15m) that assess emotional attachment to the Army (e.g., "I feel a strong sense of belonging to the Army"). Factor analysis of these items yielded one main factor that explained 54.4% of the variance. The coefficient alpha for this composite was .83.

Continuance Intentions

The Continuance Intentions composite included two items (Questions 52 and 53) about how long Soldiers plan to remain in the Army (e.g., expected years of active duty service). The coefficient alpha for this composite was .87.

Generalized Self Efficacy

The Generalized Self Efficacy composite consisted of five items (31a, 31b, 31c, 31d, and 31e) that assess confidence in various areas of Army life, including maintaining physical fitness, having skills to perform well, and earning promotions. Factor analysis of these items revealed

one main factor that accounted for 67.6% of the variance in responses. The coefficient alpha for this composite was .88.

Table 2.4. End-of-Training Survey (End of BCT) Composites

Variable	Items	Scale	*M*	*SD*	Skew	α
Affective Commitment	6	1-5	3.82	0.73	-0.68	.83
Continuance Intentions	2	1-6, 1-9	6.61	4.49	0.84	.87
Generalized Self Efficacy	5	1-5	4.22	0.76	-1.22	.88
Importance of Core Army Values						
Duty, Integrity, and Personal Courage	12	1-7	6.33	0.85	-2.52	.96
Loyalty and Selfless Service	4	1-7	5.98	1.16	-1.58	.91
Incidents of Discrimination*	5	0-1	0.13	0.41	4.06	.35
Job Performance (self-rated)	3	1-5	3.60	0.84	-0.36	.80
Military versus Civilian Life						
Benefits	2	1-5	4.30	0.81	-1.53	.71
Job Characteristics	7	1-5	3.90	0.72	-0.83	.81
Pay	2	1-5	2.77	1.19	0.09	.77
Time for Personal Life	3	1-5	2.25	1.01	0.73	.78
Overall	14	1-5	3.45	0.68	-0.26	.87
Perceived Fit with Army	2	1-5	4.04	0.65	-0.67	.63
Physical Fitness	2	1-5	3.85	0.90	-0.69	.61
Possible Reasons for Leaving Army						
Discrimination	3	0-1	0.06	0.19	3.70	.74
Medical Issues	2	0-1	0.25	0.38	1.11	.68
Problems Adjusting	5	0-1	0.12	0.22	1.98	.68
All Reasons*	23	0-1	3.02	3.23	1.87	.82
Satisfaction						
Army Life	8	1-5	3.59	0.62	-0.46	.77
Officers	2	1-5	3.56	0.76	-0.45	.74
Supervision						
Leader Self-Promotion	3	1-5	2.29	0.93	0.56	.71
Leader Support	6	1-5	3.45	0.81	-0.62	.78
Training	8	1-5	3.71	0.63	-0.48	.83
Work-Family Balance	2	1-5	3.60	0.85	-0.51	.70
Unsure about Army Career*	6	0-1	0.86	1.09	1.48	.49

Note. Listwise N = 19,654. *Composite was calculated by summing the number of items endorsed by each respondent.

Importance of Core Army Values

EOTS Question 32 asked respondents to rate the importance of several core Army values. Factor analysis of the 16 items from this question yielded two factors that accounted for 70.4% of the variance. The first factor, Duty, Integrity, and Personal Courage, included 12 items (32c, 32f, 32g, 32h, 32i, 32j, 32k, 32l, 32m, 32n, 32o, and 32p) that assess the importance of individual values (e.g., personal responsibility). The second factor, Loyalty and Selfless Service,

included four items (32a, 32b, 32d, and 32e) about loyalty to people/entities beyond one's own self interests (e.g., unit, the Army). The coefficients alpha for the two composites were .96 and .91, respectively.

Incidents of Discrimination

Question 21 of the EOTS asked respondents whether they had been discriminated against for each of five reasons since arriving on post (e.g., because of race). The Incidents of Discrimination scale was calculated by summing the number of reasons each respondent selected. The coefficient alpha for this composite was .36.

Job Performance (self-rated)

Respondents were asked to indicate how their drill sergeant would rate the respondent's effort, personal discipline, and overall effectiveness. Job Performance is a composite of these three items (27a, 27b, and 27d). The coefficient alpha for this composite was .80.

Military versus Civilian Life

In Question 28 of the EOTS, respondents were asked to compare military and civilian life in several areas. Factor analysis of the 14 items from this question produced four main factors that accounted for 63.7% of the variance in responses. The first factor, called Benefits, included two items (28b and 28c) about job benefits (e.g., retirement benefits). The second factor, Job Characteristics, comprised six items (28d, 28e, 28f, 28g, 28k, and 28m) that deal with the relative quality of various aspects job characteristics (e.g., job security). The third factor, Pay, included two items (28a and 28n) where respondents were asked to compare pay in military versus civilian occupations (e.g., total family income). The remaining four items (28h, 28i, 28j, and 28l) loaded on a fourth factor called Time for Personal Life, which measured satisfaction with aspects of personal life (e.g., personal freedom). We also created an overall military versus civilian composite that contains all 14 items. The coefficients alpha for the resulting composites were .71, .81, .77, .78, and .87, respectively.

Perceived Fit with Army

Question 33 asked respondents to rate the extent to which their values match the values of the Army, and Question 34 asked them to rate the degree to which they are the type of Soldier the Army wants. These items were aggregated to form a single composite called Perceived Fit with Army. The coefficient alpha for the composite was .63.

Physical Fitness

The Physical Fitness composite consisted of two survey items: self-rated physical fitness (27c) and level of confidence in completing physical requirements (31c). The coefficient alpha for this composite was .61.

Possible Reasons for Leaving Army

Question 35 asked respondents to rate how likely they would be to leave the Army for each of 23 reasons. Factor analysis of these dichotomously scored items revealed three factors that explained 37.6% of the variance in responses. The first factor, called Discrimination, included three items (35l, 35m, and 35q) that assessed the likelihood of leaving because of racial or gender discrimination. The second factor was called Medical Reasons and consisted of Items 35h and 35o, which asked about leaving for medical conditions (e.g., illness). The third factor, Problems Adjusting, comprised five items (35b, 35i, 35j, 35k, and 35r) that asked Soldiers whether they would leave because they could not adjust to Army life (e.g., homesickness). The remaining eight items did not load on any of these factors and were therefore treated as individual variables in the analyses. We did, however, develop a composite called All Reasons, which included all 23 items from this question. The coefficients alpha of these composites were .74, .68, .68, and .82, respectively.

Satisfaction

Numerous EOTS items asked respondents to rate their satisfaction with various aspects of the Army. Analysis of the data suggested that these items could be grouped into the following composites.

Satisfaction with Army Life. Several survey items measured general satisfaction with life in the Army (e.g., the Army's structured, ordered lifestyle). Satisfaction with Army Life is a composite of eight items (7, 15j, 25i, 25j, 25k, 25l, 25m, and 37), which loaded on one factor that accounted for 39.3% of the variance in responses. The coefficient alpha for this composite was .77.

Satisfaction with Officers. Two survey items (25b and 25c) assessed satisfaction with Army non-commissioned and commissioned officers, respectively. These two items were combined to form the Satisfaction with Officers composite, which had a coefficient alpha of .74.

Satisfaction with Training. Several EOTS items measured satisfaction with aspects of Basic Training, such as whether it contributed to professional development and prepared Soldiers for future assignments. Factor analysis revealed that eight items (4, 8a, 8b, 8c 8d, 9, 10, and 11) loaded together as a single factor that accounted for 45.9% of the variance in ratings. These items were combined to form the Satisfaction with Training composite, which had a coefficient alpha of .83.

Satisfaction with Supervision. Question 26 of the EOTS included nine items that assess attitudes about Army leadership. Factor analysis of these items identified two factors that explained 53.1% of the variance in responses. The first factor, Leader Support, consisted of six items (26a, 26c, 26d, 26g, 26h, and 26i) that assessed how supportive respondents think their supervisors are (e.g., "NCOs in my chain of command were a good source of support for Soldiers"). The second factor was called Leader Self-Promotion, and was made up of the remaining three items (26b, 26e, and 26f). These items assessed the extent to which respondents believe their supervisors were concerned primarily about their own interests (e.g., "Leaders in the unit were more interested in looking good than being good"). The coefficients alpha for these composites were .78 and .71, respectively.

Satisfaction with Work-Family Balance. Two survey items (15a and 15b) assessed satisfaction with the work-family balance Army life offers (e.g., "Army allows me to maintain the kind of balance I want between my work and personal life"). These two items were combined to form a composite called Satisfaction with Work-Family Balance, which had a coefficient alpha of .70.

Unsure about Army Career

Item 54 of the EOTS asked respondents to indicate whether each of six reasons caused them to feel unsure about a career in the Army (e.g., lack of Army experience, unclear career goals). The Unsure about Army Career composite was created by summing the number of reasons for uncertainty each respondent indicated. Because Soldiers' responses to Question 54 were viewed as formative measures of the uncertainty construct, it is not meaningful to report a coefficient alpha for this composite.

End-of-Training Survey (End of AIT/OSUT)

The EOTS was also administered to Soldiers upon completion of Advanced Individual Training (AIT) and One Station Unit Training (OSUT). Analysis of the data resulted in the same 25 composites found in the end of BCT analyses described above. The descriptive statistics and reliability estimates for these composites are presented in Table 2.5.

Annual First Term Survey 2001

The Annual First Term Survey 2001 (AS01) included 42 questions (168 items). Analysis of the data resulted in 30 composites that represented 141 items. Table 2.6 displays the descriptive statistics and reliability estimates for these composites. Descriptions of each composite are presented below.

Affective Commitment

Several AS01 items assessed emotional attachment to the Army (e.g., "I feel a strong sense of belonging to the Army"). Factor analysis identified seven items (11c, 11f, 11g, 11i, 11j, 11k, and 11n) that loaded on one factor, which explained 58.7% of the variance in those items. The coefficient alpha for the resulting Affective Commitment composite was .88.

Continuance Commitment

Two AS01 items (11l and 11m) assessed how feasible it would be for respondents to leave the Army if they wanted (e.g., "One of the problems with leaving the Army would be the lack of good alternatives."). Scores from the two items were combined to form the Continuance Commitment composite, which had a coefficient alpha of .63.

Table 2.5. End-of-Training Survey (End of AIT/OSUT) Composites

Variables	Items	Scale	*M*	*SD*	Skew	α
Affective Commitment	6	1-5	3.59	0.77	-0.57	.85
Continuance Intentions	2	1-6,1-9	5.96	4.37	1.06	.87
Generalized Self Efficacy	5	1-5	4.11	0.79	-1.03	.87
Importance of Core Army Values						
Duty, Integrity, and Personal Courage	12	1-7	6.20	0.90	-1.92	.95
Loyalty and Selfless Service	4	1-7	5.83	1.25	-1.39	.92
Incidents of Discrimination*	5	0-1	0.14	0.43	3.74	.33
Job Performance (self-rated)	4	1-5	3.68	0.83	-0.46	.81
Military versus Civilian Life						
Benefits	2	1-5	4.08	0.93	-1.22	.74
Job Characteristics	7	1-5	3.65	0.78	-0.61	.82
Pay	2	1-5	2.37	1.15	0.46	.77
Time for Personal Life	3	1-5	2.03	0.95	0.97	.78
Overall	14	1-5	3.19	0.70	-0.12	.88
Perceived Fit with Army	2	1-5	3.99	0.70	-0.86	.65
Physical Fitness	2	1-5	3.92	0.87	-0.76	.61
Possible Reasons for Leaving the Army						
Discrimination	3	0-1	0.05	0.18	3.75	.73
Medical Issues	2	0-1	0.25	0.38	1.16	.68
Problems Adjusting	5	0-1	0.15	0.24	1.67	.70
All Reasons*	23	0-1	3.30	3.45	1.88	.82
Satisfaction						
Army Life	8	1-5	3.39	0.71	-0.48	.82
Officers	2	1-5	3.47	0.78	-0.48	.72
Supervision						
Leader Self-Promotion	3	1-5	2.45	0.93	0.42	.72
Leader Support	6	1-5	3.38	0.83	-0.52	.81
Training	8	1-5	3.55	0.67	-0.47	.84
Work-Family Balance	2	1-5	3.32	0.92	-0.40	.73
Unsure about Army Career*	6	0-1	0.89	1.10	1.49	.48

Note. Listwise $N = 15{,}621$. *Composite was calculated by summing the number of items endorsed by each respondent.

Table 2.6. Annual First-Term Survey 2001 (AS01) Composites

Variable	Items	Scale	*M*	*SD*	Skew	α
Affective Commitment	7	1-5	2.81	0.87	-0.11	.88
Continuance Commitment	2	1-5	2.40	1.04	0.31	.63
Continuance Intentions	2	1-6, 1-9	2.82	1.28	1.24	.78
Deployment Activity	2	1-4, 0-1	1.08	1.39	0.91	.74
Generalized Self Efficacy	5	1-5	3.75	0.88	-0.73	.83
Importance of Core Army Values						
Duty, Integrity, and Personal Courage	10	1-7	5.78	1.11	-1.35	.92
Loyalty and Selfless Service	5	1-7	5.14	1.48	-0.79	.91
Job Performance (self-rated)	3	1-5	3.77	0.94	-0.63	.86
Military vs. Civilian Life						
Benefits	2	1-5	3.35	1.07	-0.51	.73
Pay	2	1-5	1.89	0.98	1.02	.79
Quality of the Organization	2	1-5	3.06	1.05	-0.29	.79
Time for a Personal Life	4	1-5	1.84	0.87	1.18	.86
Overall	15	1-5	2.60	0.70	0.16	.89
Perceived Fit with Army	2	1-5	3.62	0.85	-0.72	.61
Perceived Procedural Justice	5	1-5	3.56	0.97	0.45	.79
Physical Fitness	2	1-5	3.70	0.99	-0.59	.68
Possible Reasons for Leaving Army						
Deviance	3	0-1	0.08	0.22	2.82	.68
All Reasons*	11	0-1	2.30	1.81	1.37	.64
Pride in Unit	3	1-5	3.41	0.95	-0.50	.75
Satisfaction						
Army Life	10	1-5	2.71	0.79	-0.04	.87
Army Medical Care	2	1-5	3.24	1.10	-0.42	.85
Army Recreational Services	2	1-5	3.15	1.01	-0.39	.91
Army Services for Families	2	1-5	3.03	0.88	-0.39	.92
Army Training and Experiences	4	1-5	4.12	0.87	-0.16	.83
Coworkers	4	1-5	3.45	0.69	-0.58	.71
Opportunities for Travel and Education	7	1-5	2.81	0.78	-0.12	.81
Supervision						
Leader Expectations	8	1-5	3.29	0.75	-0.39	.85
Leader Support	8	1-5	2.92	0.88	-0.18	.89
Work-Family Balance	2	1-5	2.49	1.01	0.24	.74
Work Itself	5	1-5	2.98	0.95	-0.22	.86

Note. Listwise $N = 14{,}798$. *Composite was calculated by summing the number of items endorsed by each respondent.

Continuance Intentions

The Continuance Intentions composite included two items (Questions 37 and 38) that assessed how long Soldiers plan to remain in the Army (e.g., expected years of active duty service). The coefficient alpha for this composite was .78.

Deployment Activity

Questions 20 and 21 of the AS01 asked respondents about their recent deployments (e.g., number of times deployed in last 12 months). These items were combined to form the Deployment Activity composite. The coefficient alpha for the resulting composite was .74.

Generalized Self Efficacy

The Generalized Self Efficacy composite included six items (9a, 9b, 9c, 9d, 9e, and 9f) that assessed confidence in various areas of Army life, including maintaining physical fitness, having skills to perform well, and earning promotions. Factor analysis of these items revealed one main factor that accounted for 59.1% of the variance in responses. The coefficient alpha for this composite was .83.

Importance of Core Army Values

Soldiers who completed the AS01 were asked to evaluate the importance of several core Army values. Factor analysis of the 16 items produced two factors that accounted for 55.6% of the variance in responses. The first factor, called Duty, Integrity, and Personal Courage, included 11 items (14c, 14g, 14h, 14i, 14j, 14k, 14l, 14m, 14n, 14o, and 14p) about individual values (e.g., personal responsibility). The second factor, Loyalty and Selfless Service, comprised five items (14a, 14b, 14d, 14e, and 14f) about loyalty to people/entities beyond one's own self interests (e.g., unit and Army). The coefficients alpha for the two composites were .92 and .91, respectively.

Job Performance (self-rated)

Question 16 of the AS01 asked respondents to evaluate how their immediate supervisor would rate their effort, personal discipline, and overall effectiveness (16a, 16b, 16d). Scores on these three items were averaged to form the Job Performance composite, which had a coefficient alpha of .86.

Military versus Civilian Life

Question 29 of the AS01 asked respondents to compare military and civilian life in several areas. Factor analysis of the 15 items for this question produced four main factors that accounted for 66.7% of the variance. The first factor, called Benefits, included two items (29b and 29c) about job benefits (e.g., retirement benefits). The second factor, Pay consisted of two items (29a and 29o) in which respondents were asked to compare pay in military versus civilian occupations (e.g., total family income). The third factor was called Quality of the Organization and included two items (29k and 29l) about the Army as an organization (e.g., level of integrity in organization). The remaining four items (29h, 29i, 29j, and 29m) loaded on a fourth factor

called Time for Personal Life, which measured satisfaction with aspects of personal life (e.g., personal freedom). We also created an overall military versus civilian composite that contained all of the items, including the five items not in one of the composites. The coefficients alpha for the resulting composites were .73, .79, .79, .86, and .89.

Perceived Fit with Army

AS01 Item 15 asked respondents to rate the extent to which their values match the values of the Army, and item 17 asked them to rate the extent to which they are the type of Soldier the Army wants. These items were aggregated to form a single composite called Perceived Fit with Army. The coefficient alpha for this composite was .61.

Perceived Procedural Justice

The Perceived Procedural Justice composite included five items (10a, 10b, 10c, 10d, and 10e) that assessed perceptions of discrimination and procedural justice in the Army (e.g., unfair promotion practices). Factor analysis of these items produced one factor that explained 54.0% of the variance. The coefficient alpha for this composite was .79.

Physical Fitness

The Physical Fitness composite comprised two items: confidence in maintaining the required level of physical fitness (9c) and self-rated physical fitness (16c). The coefficient alpha for this composite was .68.

Possible Reasons for Leaving Army

On Item 26 of the AS01, respondents were asked to rate the likelihood that they would leave the Army for each of 11 reasons. Factor analysis of these dichotomously scored items indicated that only three items (26d, 26e, and 26j) were intercorrelated enough to combine into a single composite, which we labeled Deviance (e.g., would have to leave due to disciplinary offenses). The remaining eight items were analyzed individually; however, we did create a composite called All Reasons, which included all 11 items from this question. The coefficients alpha for these two composites were .68 and .64, respectively.

Pride in Unit

Three survey items (12m, 12n, and 12o) measured Soldiers' attitudes about their unit (e.g., "I am proud to be a member of my unit"). Ratings of these items were averaged to form a composite called Pride in Unit, which had a coefficient alpha of .75.

Satisfaction

Numerous AS01 items asked respondents to rate their satisfaction with various aspects of the Army. Analysis of the data suggested that these items could be grouped into the following composites.

Satisfaction with Army Life. Several survey items asked respondents to rate how satisfied they were with life in the Army (e.g., amount of personal freedom, length of enlistment). Factor analysis identified 10 items (4, 13i, 13j, 13k, 13m, 13n, 13o, 13p, 24, and 34) that loaded on a single factor, which explained 47.4% of the variance in ratings. The resulting composite, Satisfaction with Army Life, had a coefficient alpha of .87.

Satisfaction with Army Medical Care. Items 18m and 18n asked respondents to rate their satisfaction with the quality and availability of Army medical care, respectively. These items were combined to form the Satisfaction with Army Medical Care composite, which had a coefficient alpha of .85.

Satisfaction with Army Recreational Services. Items 18o and 18p asked respondents to rate their satisfaction with the quality and availability of Army recreational services, respectively. These items were combined to form the Satisfaction with Army Recreational Services composite, which had a coefficient alpha of .91.

Satisfaction with Army Services for Families. Items 18q and 18r asked respondents to rate their satisfaction with the quality and availability of Army services for families, respectively. These items were combined to form the Satisfaction with Army Services for Families composite, which had a coefficient alpha of .92.

Satisfaction with Army Training Experiences. Survey respondents were asked to rate the extent to which their Army training and experiences have prepared them for various activities (e.g., to perform future assignments). Factor analysis of these four items (2a, 2b, 2c, and 2d) yielded one main factor that accounted for 66.0% of the variance. The coefficient alpha for this composite was .83.

Satisfaction with Coworkers. The AS01 included four items (13a, 13b, 13c, and 13d) about satisfaction with coworkers (e.g., satisfaction with peer relationships). Factor analysis of these items revealed one main factor that explained 53.8% of the variance. The resulting composite, Satisfaction with Coworkers, had a coefficient alpha of .71.

Satisfaction with Opportunities for Travel and Education. The survey also asked respondents to rate their satisfaction with travel and educational opportunities the Army provides (e.g., geographic location of jobs). Factor analysis yielded seven items (18d, 18e, 18h, 18i, 18j, 18k, and 18l) that loaded together on a single factor, which accounted for 46.7% of the variance. The resulting composite, Satisfaction with Opportunities for Travel and Education, had a coefficient alpha of .81.

Satisfaction with Supervision. Several AS01 items assessed satisfaction with unit leadership. Analyses of these items revealed two main factors that explained 46.6% of the variance. The first factor, Leader Support, consisted of seven items (12b, 12c, 12d, 12f, 12g, 18i, and 18l) that assessed whether unit leaders are supportive of their Soldiers (e.g., "Leaders in my unit treat Soldiers with respect."). The second factor was called Leader Expectations and included eight items (12a, 12e, 12f, 12g, 12h, 12j, 12k, and 13f) about the expectations supervisors have regarding Soldier performance (e.g., "The members of my unit know what is expected of them."). The coefficients alpha for these composites were .89 and .85, respectively.

Satisfaction with Work-Family Balance. AS01 Items 11a and 11b assessed satisfaction with the work-family balance Army life affords (e.g., "Army allows me to maintain the kind of balance I want between my work and personal life."). These two items were combined to form a composite called Satisfaction with Work-Family Balance, which had a coefficient alpha of .74.

Satisfaction with Work Itself. Five AS01 items (6, 13l, 18a, 18b, and 18c) measured Soldiers' satisfaction with the work they perform (e.g., satisfaction with military occupational specialty [MOS]). Factor analysis showed that these items loaded on a single factor that accounted for 63.9% of the variance. Thus, these items were combined to form the Satisfaction with Work Itself composite, which had a coefficient alpha of .86.

Annual First Term Survey 2002

The Annual First Term Survey 2002 (AS02) contained 49 questions (177 items) and was highly similar to the AS01. Thus, with a few exceptions, analysis of the AS02 data yielded the same composite variables. Table 2.7 displays the descriptive statistics and reliability estimates for the 32 composites (155 total items). Descriptions of each composite are provided below.

Affective Commitment

Several AS02 items assessed emotional attachment to the Army (e.g., "I feel a strong sense of belonging to the Army."). Factor analysis identified seven items (9c, 9f, 9g, 9i, 9j, 9k, and 9n) that loaded on one factor that explained 57.7% of the variance in those items. The coefficient alpha for the resulting Affective Commitment composite was .87.

Continuance Commitment

Two AS02 items (9l and 9m) assessed how feasible it would be for respondents to leave the Army if they wanted (e.g., "One of the problems with leaving the Army would be the lack of good alternatives."). Scores from the two items were combined to form the Continuance Commitment composite, which had a coefficient alpha of .66.

Continuance Intentions

The Continuance Intentions composite included two items (Questions 44 and 45) that assessed how long Soldiers plan to remain in the Army (e.g., expected years of active duty service). The coefficient alpha for this composite was .83.

Deployment Activity

Questions 19 and 20 of the AS02 asked respondents about their recent deployments (e.g., number of times deployed in last 12 months). These items were combined to form the Deployment Activity composite. The coefficient alpha for this composite was .73.

Table 2.7. Annual First-Term Survey 2002 (AS02) Composites

	Items	Scale	*M*	*SD*	Skew	α
Affective Commitment	7	1-5	2.86	0.86	-0.10	.87
Continuance Commitment	2	1-5	2.46	1.07	0.26	.66
Continuance Intentions	2	1-5	3.11	1.36	1.09	.83
Deployment Activity	2	1-4, 0-1	0.95	1.30	1.09	.73
Generalized Self Efficacy	6	1-5	2.95	0.86	-0.07	.84
Importance of Core Army Values						
Duty, Integrity, and Personal Courage	11	1-7	5.82	1.09	-1.35	.93
Loyalty and Selfless Service	5	1-7	5.32	1.40	-0.90	.90
Job Performance (self-rated)	3	1-5	3.80	0.93	-0.67	.86
Military versus Civilian Life						
Benefits	2	1-5	3.37	1.03	-0.51	.73
Pay	2	1-5	2.01	0.99	0.82	.79
Quality of the Organization	2	1-5	3.04	1.02	-0.25	.80
Time for Personal Life	4	1-5	1.96	0.85	0.98	.87
Overall	15	1-5	2.63	0.69	0.15	.89
Perceived Fit with Army	2	1-5	3.71	0.85	-0.81	.63
Perceived Procedural Justice	5	1-5	2.54	0.97	0.45	.81
Possible Reasons for Leaving Army						
Deviance	3	0-1	0.07	0.20	3.15	.72
All Reasons*	14	0-1	3.33	2.22	1.12	.66
Pride in Unit	3	1-5	3.37	0.92	-0.47	.71
Problems in Unit						
Low Commitment	3	1-5	2.82	1.06	0.17	.76
All Problems*	7	1-5	17.60	6.15	0.17	.75
Satisfaction						
Army Life	10	1-5	2.74	0.79	-0.06	.88
Army Medical Care	2	1-5	3.21	1.11	-0.39	.85
Army Recreational Services	2	1-5	3.17	0.99	-0.43	.91
Army Services for Families	2	1-5	3.07	0.90	-0.40	.92
Army Training and Experiences	4	1-5	3.16	0.88	-0.20	.84
Coworkers	4	1-5	3.46	0.70	-0.59	.73
Opportunities for Travel and Education	7	1-5	2.83	0.78	-0.10	.81
Supervision						
Leader Expectations	8	1-5	3.15	0.72	-0.33	.83
Leader Support	7	1-5	2.87	0.86	-0.17	.88
Work-Family Balance	2	1-5	2.48	0.99	0.18	.74
Work Itself	5	1-5	2.98	0.95	-0.21	.86
Workload	2	8-16, 1-12	9.06	2.03	0.05	.76

Note. Listwise $N = 12{,}932$. *Composite was calculated by summing the number of items endorsed by each respondent.

Generalized Self Efficacy

The Generalized Self Efficacy composite included six items (7a, 7b, 7c, 7d, 7e, and 7f) that assess confidence in various areas of Army life, including maintaining physical fitness, having skills to perform well, and earning promotions. Factor analysis of these items revealed one main factor that accounted for 55.5% of the variance in responses. The coefficient alpha for this composite was .84.

Importance of Core Army Values

Soldiers who completed the AS02 were asked to evaluate the importance of several core Army values. Factor analysis of the 16 items produced two factors that accounted for 57.5% of the variance in responses. The first factor, called Duty, Integrity, and Personal Courage, included 11 items (13c, 13g, 13h, 13i, 13j, 13k, 13l, 13m, 13n, 13o, and 13p) about individual values (e.g., personal responsibility). The second factor, Loyalty and Selfless Service, included five items (13a, 13b, 13d, 13e, and 13f) about loyalty to people/entities beyond one's own self interests (e.g., unit and Army). The coefficients alpha for the two composites were .93 and .90, respectively.

Job Performance (self-rated)

Item 15 of the AS02 asked respondents to evaluate how their immediate supervisor would rate their effort, personal discipline, and overall effectiveness (15a, 15b, 15d). Scores on these three items were averaged to form the Job Performance composite, which had a coefficient alpha of .86.

Military versus Civilian Life

Question 30 of the AS02 asked respondents to compare military and civilian life in several areas. Factor analysis of the 15 items produced four main factors that accounted for 67.3% of the variance. The first factor, called Benefits, included two items (30b and 30c) about job benefits (e.g., retirement benefits). The second factor, Pay, included two items (30a and 30o) in which respondents were asked to compare pay in military versus civilian occupations (e.g., total family income). The third factor was called Quality of the Organization and included two items (30k and 30l) about the Army as an organization (e.g., level of integrity in organization). The remaining four items (30h, 30i, 30j, and 30m) loaded on a fourth factor called Time for Personal Life, which measured satisfaction with aspects of personal life (e.g., personal freedom). We also created an overall military versus civilian composite that contained all of the items, including the five items not in one of the composites. The coefficients alpha for the resulting composites were .73, .79, .80, .87, and .89.

Perceived Fit with Army

AS02 Question 14 asked respondents to rate the extent to which their values match the values of the Army, and Question 16 asked them to rate the extent to which they are the type of Soldier the Army wants. These items were aggregated to form a single composite called Perceived Fit with Army. The coefficient alpha for this composite was .63.

Perceived Procedural Justice

The Perceived Procedural Justice composite included five items (8a, 8b, 8c, 8d, and 8e) that assessed perceptions of discrimination and procedural justice in the Army (e.g., unfair promotion practices). Factor analysis of these items produced one factor that explained 55.8% of the variance. The coefficient alpha for this composite was .81.

Possible Reasons for Leaving Army

On Question 27 of the AS02, respondents were asked to rate the likelihood that they would leave the Army for each of 14 reasons. Factor analysis of these dichotomously scored items indicated that only three items (27e, 27f, and 27l) were intercorrelated enough to combine into a single composite, which we labeled Deviance (e.g., would have to leave due to disciplinary offenses). The remaining 11 items were analyzed individually; however, we did create a composite called All Reasons, which included all 14 items from this question. The coefficients alpha for these two composites were .72 and .66, respectively.

Pride in Unit

Three survey items (11m, 11n, and 11r) measured Soldiers' attitudes about their units (e.g., "I am proud to be a member of my unit."). Ratings of these items were averaged to form a composite called Pride in Unit, which had a coefficient alpha of .71.

Problems in Unit

Question 10 of the AS02 asked respondents to rate the extent to which seven issues are problems in their units. Factor analysis of these items revealed one main factor that accounted for 41.2% of the variance in responses. We called this factor Low Commitment, which consisted of three items (10a, 10b, and 10c) about lack of commitment within one's unit (e.g., lack of discipline). We also created an overall composite called All Problems by summing the ratings from all seven items. The coefficients alpha for these two composites were .76 and .75, respectively.

Satisfaction

Numerous AS02 items asked respondents to rate their satisfaction with various aspects of the Army. Analysis of the data suggested that these items could be grouped into the following composite variables.

Satisfaction with Army Life. Several survey items asked respondents to rate how satisfied they were with life in the Army (e.g., amount of personal freedom, length of enlistment). Factor analysis identified 10 items (3, 12i, 12j, 12k, 12m, 12n, 12o, 12p, 23, and 43) that loaded on a single factor, which explained 47.1% of the variance in ratings. The resulting composite, Satisfaction with Army Life, had a coefficient alpha of .88.

Satisfaction with Army Medical Care. Items 17m and 17n asked respondents to rate their satisfaction with the quality and availability of Army medical care, respectively. These items were combined to form the Satisfaction with Army Medical Care composite, which had a coefficient alpha of .85.

Satisfaction with Army Recreational Services. Items 17o and 17p asked respondents to rate their satisfaction with the quality and availability of Army recreational services, respectively. These items were combined to form the Satisfaction with Army Recreational Services composite, which had a coefficient alpha of .91.

Satisfaction with Army Services for Families. Items 17q and 17r asked respondents to rate their satisfaction with the quality and availability of Army services for families, respectively. These items were combined to form the Satisfaction with Army Services for Families composite, which had a coefficient alpha of .92.

Satisfaction with Army Training Experiences. Survey respondents were asked to rate the extent to which their Army training and experiences have prepared them for various activities (e.g., to perform future assignments). Factor analysis of these four items (2a, 2b, 2c, and 2d) yielded one main factor that accounted for 68.3% of the variance in responses. The coefficient alpha for this composite was .84.

Satisfaction with Coworkers. The AS02 included four items (12a, 12b, 12c, and 12d) about satisfaction with coworkers (e.g., satisfaction with peer relationships). Factor analysis of these items revealed one main factor that explained 55.3% of the variance. The resulting composite, Satisfaction with Coworkers, had a coefficient alpha of .73.

Satisfaction with Opportunities for Travel and Education. The survey also asked respondents to rate their satisfaction with travel and educational opportunities the Army provides (e.g., geographic location of jobs). Factor analysis yielded seven items (17d, 17e, 17h, 17i, 17j, 17k, and 17l) that loaded together on a single factor, which accounted for 47.4% of the variance in responses. The resulting composite, Satisfaction with Opportunities for Travel and Education, had a coefficient alpha of .81.

Satisfaction with Supervision. Several AS02 items were meant to assess satisfaction with unit leadership. Analyses of these items revealed two main factors that explained 47.3% of the variance. The first factor, Leader Support, consisted of seven items (11b, 11c, 11d, 11i, 11l, 17f, and 17g) that assessed whether unit leaders are supportive of their Soldiers (e.g., "Leaders in my unit treat Soldiers with respect."). The second factor was called Leader Expectations and consisted of eight items (11a, 11e, 11f, 11g, 11h, 11j, 11k, and 12f) about the expectations supervisors have regarding Soldier performance (e.g., "The members of my unit know what is expected of them."). The coefficients alpha for these composites were .88 and .83, respectively.

Satisfaction with Work-Family Balance. AS02 Items 9a and 9b assessed satisfaction with the work-family balance Army life affords (e.g., "Army allows me to maintain the kind of balance I want between my work and personal life"). These two items were combined to form a composite called Satisfaction with Work-Family Balance, which had a coefficient alpha of .73.

Satisfaction with Work Itself. Five AS02 items (4, 12l, 17a, 17b, and 17c) measured Soldiers' satisfaction with the work they perform (e.g., satisfaction with MOS). Factor analysis showed that these items loaded on a single factor that accounted for 64.3% of the variance. Thus, these items were combined to form the Satisfaction with Work Itself composite. The coefficient alpha for this composite was .86.

Workload

Those who completed the AS02 were asked to indicate how many hours they work in an average day (Question 40), as well as how many hours they work in an average week (Question 41). These items were used to create a composite called Workload. The coefficient alpha for this composite was .76.

Soldier Exit Survey Composites

The Soldier Exit Survey contained 14 questions (59 total items). Analysis of the data resulted in six composite variables that represented 18 items. The descriptive statistics and reliability estimates for these composites are displayed in Table 2.8. Descriptions of each composite are provided below.

Reasons for Leaving Army

Question 5 of the Exit Survey asked respondents to indicate the extent to which each of 23 reasons contributed to their leaving the Army. Factor analysis of these items yielded five factors that accounted for 55.4% of the variance in responses. The first factor, Deviance, consisted of two items that assessed leaving for one or more serious offenses (5e) and minor offenses or disciplinary problems (5f). The second factor, Discrimination, comprised three items (5l, 5m, and 5q) related to leaving for discrimination or harassment reasons. The third factor, Physical/Medical Problems, assessed leaving due to a physical or medical condition. The composite included three items from Question 5 (5a, 5h, and 5o) and Items 4 and 6a. The fourth factor, Problems Adjusting, consisted of three items (5b, 5i, and 5j) that assessed leaving because of problems adjusting to Army life (e.g., being homesick). Finally, the fifth factor was called Problems with Supervision. It included three items (5k, 5v, and 5w) about leaving due to problems with supervisors (e.g., verbal abuse from training staff members). The coefficients alpha for the five composites were .69, .71, .60, .77, and .78, respectively.

Table 2.8. Soldier Exit Survey Composites

Variables	Items	Scale	*M*	*SD*	Skew	α
Reasons for Leaving Army						
Deviance	2	1-5	1.30	0.73	2.98	.69
Discrimination	3	1-5	1.17	0.52	4.02	.71
Physical/Medical Problems	5	1-5	2.53	0.93	0.29	.60
Problems Adjusting	3	1-5	2.28	1.22	0.63	.77
Problems with Supervision	3	1-5	1.75	1.08	1.45	.78
Satisfaction with Training	4	1-5	3.43	0.99	-0.45	.78

Note. Listwise $N = 4{,}349$.

Satisfaction with Training

Question 3 of the Exit Survey asked respondents to rate their satisfaction with various aspects of the Army (e.g., their recruiters, DEP experience, and MOS). Factor analysis of these items revealed three items (3e, 3f, and 3g) that assessed satisfaction with training. Question 8

also loaded with these items. Thus, the four items were combined into a single composite called Satisfaction with Training, which had a coefficient alpha of .78.

CODING OF CRITERION VARIABLES

We examined two types of criterion variables in this research: attrition and reenlistment. Several different attrition criteria were formed based on data obtained from Enlisted Master File (EMF) data files. The following sections detail how attrition and reenlistment variables were coded for this investigation.

Coding of Attrition Variables

The longitudinal analyses conducted in this investigation required that we know the status (e.g., attritee *v.* still-in-service) of every Soldier in the research cohort at the end of each month of his/her service. Thus, we developed a strategy for coding Soldiers' attrition status over time. Data on Soldiers' status were current through March 31, 2003 (2nd Quarter FY2003 EMF file). For our analyses, we classified Soldiers into one of four categories for each month of service they entered. Those categories were as follows:

- Attritee
- Left Service- Omitted from Analyses
- Left Service- Not Considered Attrition
- Stayer

Soldiers were classified into the *attritee* category for a given month of service if they met either of two conditions. First, a Soldier was classified as an attritee if he or she had (a) an interservice separation code (ISC) indicating he/she left service for a reason considered to be attrition (see Table 2.9), and (b) a valid separation date that occurred during the given month of service.

Additionally, a Soldier was treated as an attritee if his or her active/inactive duty indicator in the quarterly EMF files indicated that they were dropped from rolls (e.g., deserter, military confinement, civilian confinement) and either (a) did not return to active duty after his or her last recorded drop, or (b) was dropped from rolls for more than one year. Dates of separation for these Soldiers were estimated as the mid-point of the fiscal year quarter from which they first were dropped from rolls. Soldiers who were dropped from rolls were treated as attritees with ISCs of 101 (Dropped from Strength- Desertion) or 102 (Dropped from Strength- Imprisonment) depending on the nature of their drop from rolls.[4] These Soldiers were treated as attritees in the month of service containing their separation date.

[4] It was sometimes necessary to impute dates of separation and ISCs for individuals who were dropped from rolls (according to the EMF active/inactive duty indicator). Specifically, sometimes "dropped from rolls" cases had no date of separation or separation program designator associated with them. We treated these Soldiers as attritees at the time they were dropped from rolls because of the sensitivity of our attrition analyses to when Soldiers left service.

Table 2.9. Coding of Interservice Separation Codes (ISC) for Attrition Analyses

ISC	Description	Treatment	*N*	%
1	Expiration of term of service	Stayer	10,208	16.4
2	Early release, insufficient retainability	Stayer	5	0.0
3	Early release, to attend school	Stayer	366	0.6
5	Early release, in the national interest	Stayer	3	0.0
8	Early release, other, including RIF, VSI, and SSB	Stayer	46	0.1
10	Condition existing prior to service	Attritee	655	1.1
11	Disability, severance pay	Omitted	1,616	2.6
12	Permanent disability retirement	Omitted	18	0.0
13	Temporary disability retirement	Omitted	230	0.4
14	Disability, no condition prior to service, no severance pay	Attritee	45	0.1
16	Unqualified for active duty, other	Attritee	3,706	5.9
17	Failure to meet weight or body fat standards	Attritee	1,047	1.7
22	Dependency or hardship	Attritee	361	0.6
31	Death, non-battle, disease	Omitted	2	0.0
32	Death, non-battle, other	Omitted	111	0.2
40	Entry into officer commissioning program	Stayer	313	0.5
50	Retirement, 20 to 30 years of service	Stayer	22	0.0
52	Retirement, other	Stayer	3	0.0
60	Character or behavior disorder	Attritee	567	0.9
64	Alcoholism	Attritee	137	0.2
65	Discreditable incidents, civilian or military	Attritee	1,689	2.7
67	Drugs	Attritee	687	1.1
71	Civil court conviction	Attritee	58	0.1
72	Security	Attritee	3	0.0
73	Court-martial	Attritee	137	0.2
74	Fraudulent entry	Attritee	193	0.3
75	AWOL or desertion	Attritee	198	0.3
76	Homosexuality	Attritee	361	0.6
78	Good of the service (discharge in lieu of court-martial)	Attritee	2,902	4.7
80	Misconduct, reason unknown	Attritee	269	0.4
83	Pattern of minor disciplinary infractions	Attritee	70	0.1
84	Commission of a serious offense	Attritee	653	1.0
85	Failure to meet minimum qualifications for retention	Attritee	9	0.0
86	Unsatisfactory performance/Expeditious Discharge Program	Attritee	679	1.1
87	Entry level performance & conduct/Trainee Discharge Program	Attritee	4,794	7.7
90	Secretarial authority	Attritee	11	0.0
91	Erroneous enlistment or induction	Attritee	64	0.1
92	Sole surviving family member	Attritee	2	0.0
94	Pregnancy	Attritee	1,084	1.7
96	Conscientious objector	Attritee	5	0.0
97	Parenthood	Attritee	574	0.9
98	Breach of contract	Attritee	28	0.0
99	Other	Attritee	185	0.3

Table 2.9. (Continued)

ISC	Description	Treatment	*N*	%
100	Immediate reenlistment	Stayer	14,607	23.4
101	Dropped from strength, desertion	Attritee	691	1.1
102	Dropped from strength, imprisonment	Attritee	279	0.4
103	Record correction	Attritee	15	0.0
105	Dropped from strength, other	Attritee	7	0.0
998	Invalid SPD	Attritee	21	0.0
999	Valid SPD with No ISC	Attritee	3	0.0

Note. *N*= Number of Soldiers in cohort with given ISC and valid date of separation. % = Percentage of Soldiers in cohort with given ISC.

Soldiers were classified into the *left service- omitted from analyses* category for a given month of service if they had (a) an ISC indicating they left service for a reason we considered beyond control of the individual Soldier (e.g., Disability- Severance Pay, Death; see Table 2.9) and (b) a valid separation date occurring during the given month of service.

Soldiers were classified into the *left service- not considered attrition* category for a given month in service if they had an ISC indicating they left service for a reason we do not consider to be attrition (e.g., Expiration of Term of Service, Entry into Officer Commissioning Program) and they had a valid separation date occurring during the given month of service. In Table 2.9, ISCs that indicate a Soldier left service, yet whose treatment is listed as "Stayer," fall into this category.

It is important to note that for our longitudinal attrition analyses, Soldiers in each of the above categories (i.e., attritee, left service- omitted from analyses, left service- not considered attrition) were treated as stayers until the month they left service, or either (a) their 48th month of service, or (b) the month their initial term of service was scheduled to expire (whichever came first). For the month these Soldiers left service, attritees were treated as attritees, Soldiers in the left service-omitted from analysis category were omitted, and Soldiers in the left service – not considered attrition were treated as stayers. For all months after the month they experienced one of these events, Soldiers were censored (i.e., excluded from attrition analyses).

For analyses on aggregated data (i.e., attrition during a given time period such as AIT), Soldiers in these categories were treated as stayers if they left service after the end of that period (e.g., if a Soldier attrited while in-unit, he/she was treated as a stayer in BCT and AIT analyses). Soldiers in the *left service- omitted from analyses* category were omitted from analyses in a given time period if they separated during or before the given time period (e.g., if a Soldier died in AIT, he/she would be counted as a stayer for BCT attrition analyses, omitted from AIT analyses, and omitted from in-unit analyses).

Soldiers were classified as stayers for a given month of service if they (a) were still in service at the end of the given month of service, or (b) had an ISC we treated as comparable to staying (e.g., Expiration of Term of Service, Entry into Officer Commissioning Program; see Table 2.9) with a valid separation date that occurred during the given month of service.

Types of Attrition

As alluded to in our introductory chapter, we examined many different types of attrition in this research. We examined different types of attrition defined not only by when they occurred (e.g., BCT attrition, AIT attrition, OSUT, in-unit attrition), but also by official reason for separation (i.e., interservice separation code).

Defining Attrition by Time

In our longitudinal (event history) analyses, we examined attrition in each month of service. The nature of the attrition criterion in each month was a conditional criterion, in that Soldiers' contribution to the risk set of attrition for any given month was conditional on their entering the given month of service (i.e., conditional on their "survival" to that point in time).

In our aggregate attrition analyses, we examined attrition as it occurred in four major time periods: BCT, AIT, OSUT, and in-unit. Additionally, we examined attrition in the overall sample, which reflected attrition that occurred between Soldiers' first month of service and either (a) their 48th month of service, or (b) the month their initial term of service was scheduled to expire (whichever came first).

For this report, BCT attrition was defined as attrition that occurred in Soldiers' first two months of service. We used the first two months of service as an estimate for the time Soldiers were in BCT because EMF and DMDC databases did not contain the dates Soldiers completed basic and transferred to AIT. For reasons detailed in later chapters, we examined first and second month attrition separately. The second month attrition criterion was a conditional criterion in that it reflected the attrition rate in the second month of service among Soldiers who completed their first month of service (i.e., first month attritees were excluded). Although Soldiers accessing into OSUT MOS do not go through the formal nine weeks of BCT that non-OSUT Soldiers do, they were included in the BCT sample to provide a comprehensive look at attrition in the first few months of service.

Our examination of AIT attrition was limited to only those Soldiers who accessed into non-OSUT MOS and completed their first two months of service. As such, the AIT attrition criterion was conditional on Soldiers' survival through BCT, and reflected attrition that occurred between a Soldier's third month of service and the month in which he/she completed AIT. Because EMF and DMDC databases did not contain the dates Soldiers completed AIT and transferred to operational units, we had to estimate an end-of-AIT date for each Soldier using AIT lengths published for each MOS. We estimated an end-of-AIT date by adding the number of days in AIT (variable by MOS) and BCT (63 days) to Soldiers' accession dates.[5] The estimates for days of AIT in a given MOS were obtained from Department of the Army Pamphlet (DA PAM) 611-21 (Military Occupational Classification and Structure) and are listed in Appendix A.

[5] We realize that there is individual variation in AIT lengths. Thus, the values we used should be viewed as estimates of a Soldier's true length in AIT. They are based on the best information available at the time of this research.

It is important to note that for some MOS, AIT lengths were either unavailable or varied so greatly that it was not possible to come up with a good estimate for training length.[6] Without clear end-of-AIT dates, it would be impossible to determine the time period (i.e., AIT or in-unit) in which Soldiers in these MOS attrited. Fortunately, Soldiers in these MOS represented a very small portion of the overall research cohort (N = 1,569, 2.9%), and as such, they were removed from all analyses reported in subsequent chapters.

Our examination of OSUT attrition was limited to only those Soldiers who accessed into OSUT MOS, and reflected attrition that occurred from the time those Soldiers accessed until the month in which they ended OSUT. As was the case with AIT, we did not have end-of-OSUT dates in the EMF or DMDC databases we worked with; thus, we estimated an end-of-OSUT date for each Soldier using OSUT lengths published for each MOS. We estimated an end-of-OSUT date by adding the number of days in OSUT (variable by MOS) to Soldiers' accession dates. The estimates for days of OSUT for a given MOS were obtained from DA PAM 611-21 and are listed in Appendix A.

Lastly, our examination of in-unit attrition was limited to only those Soldiers who completed AIT/OSUT. Soldiers were deemed as completing AIT/OSUT if they were still in service as of their end-of-AIT/OSUT date (defined above). In-unit attrition was defined by attrition that occurred between Soldiers' first month in-unit and either (a) their 48th month of service or (b) the month their initial term of service was scheduled to expire (whichever came first).

Defining Attrition by ISC

In addition to defining attrition by when it occurred, we also examined different types of attrition by interservice separation codes (ISC). Using ISC codes we differentiated between five different types of attrition: Moral Character, Performance, Medical/Physical, Pregnancy/ Parenthood, and Other.[7] The ISCs we classified into each of these categories are shown in Table 2.10 along with their frequency of occurrence within each analysis sample. The categorization of ISCs was based on rational judgment and informed by past research (as discussed below).

Of particular note in Table 2.10 is the composition of attrition during IET (i.e., BCT, AIT, OSUT). IET attrition is dominated by attrition for two ISCs: ISC 16 (Medically Unqualified for Active Duty, Other) and ISC 87 (Entry Level Performance and Character/ Trainee Discharge Program). Together these reasons account for 80.0% of attrition in the 1st month of service, 89.8% of attrition in the 2nd month of service, 83.9% of attrition in AIT, and 88.3% of attrition in OSUT.

[6] These MOS were: 00D (Special Duty Assignment), 09B (Trainee Unassigned), 09C (Trainee Language), 09S (Commissioned Officer Candidate), 09W (Warrant Officer Candidate), 18B (Special Forces Weapons Sergeant), 18C (Special Forces Engineer Sergeant), 18D (Special Forces Medical Sergeant), 75C (Unknown?) , 98G (Cryptologic Communications), and 98X (EW/SIGINT Special).

[7] See Chapter 1 for a discussion of limitations when using ISC codes to differentiate between various types of attrition.

Table 2.10. Composition of Attrition by Analysis Sample

Category of Attrition/ISC	Overall			1st Month			2nd Month			AIT			OSUT			In-Unit		
	f	%	%F	*f*	%	%F	*f*	%	%F	*f*	%	%F	*f*	%	%F	*f*	%	%F
All Attrition	21,813	100.0	26.9	1,404	100.0	46.0	2,699	100.0	32.9	2,194	100.0	37.7	1,780	100.0	9.5	14,609	100.0	23.5
Moral Character	6,810	31.2		0	0.0		4	0.1		47	2.1		7	0.4		6,753	46.2	
78 Good of the service (discharge in lieu of court-martial)	2,747	12.6	9.8							7	0.3	28.6	2	0.1	0.0	2,738	18.7	9.7
65 Discreditable incidents, civilian or military	1,665	7.6	9.4							8	0.4	12.5	2	0.1	0.0	1,655	11.3	9.4
67 Drugs	669	3.1	5.7							3	0.1	0.0				666	4.6	5.7
84 Commission of a serious offense	630	2.9	6.7							9	0.4	11.1				621	4.3	6.6
80 Misconduct, reason unknown	266	1.2	12.0				1	0.0	0.0	12	0.5	66.7				253	1.7	9.5
102 Dropped from strength, imprisonment	253	1.2	3.2				1	0.0	0.0	1	0.0	0.0	1	0.1	0.0	251	1.7	3.2
75 AWOL or desertion	192	0.9	14.6				1	0.0	100.0	6	0.3	0.0				185	1.3	14.6
64 Alcoholism	136	0.6	9.6													136	0.9	9.6
73 Court-martial	129	0.6	9.3							1	0.0	0.0				128	0.9	9.4
83 Pattern of minor disciplinary infractions	70	0.3	15.7				1	0.0	100.0							69	0.5	14.5
71 Civil court conviction	53	0.2	3.8										2	0.1	0.0	51	0.3	3.9
Performance	5,471	25.1		653	46.5		1,333	49.4		1,215	55.4		520	29.2		1,983	13.6	
87 Entry level performance-conduct/Trainee Discharge Pgm	4,788	22.0	34.1	652	46.4	46.9	1,333	49.4	38.2	1,203	54.8	40.8	520	29.2	8.1	1,313	9.0	23.3
86 Unsatisfactory performance/Expeditious Discharge Pgm	674	3.1	22.8	1	0.1	0.0				12	0.5	33.3				661	4.5	22.7
85 Failure to meet minimum qualifications for retention	9	0.0	11.1													9	0.1	11.1
Medical/Physical	5,412	24.8		615	43.8		1,232	45.6		735	33.5		1,117	62.8		2,256	15.4	
16 Medically unqualified for active duty, other	3,697	16.9	24.9	471	33.5	45.4	1,090	40.4	26.3	637	29.0	32.0	1,052	59.1	9.8	958	6.6	18.0
17 Failure to meet weight or body fat standards	1,023	4.7	20.3	12	0.9	41.7	31	1.1	16.1	22	1.0	18.2	58	3.3	20.7	929	6.4	20.5
10 Condition existing prior to service	648	3.0	40.4	132	9.4	48.5	111	4.1	53.2	75	3.4	64.0	7	0.4	0.0	326	2.2	27.9
14 Disability, no condition existing prior to SVC, no sev pay	44	0.2	34.1							1	0.0	0.0				43	0.3	34.9
Pregnancy/Parenthood	1,637	7.5		0	0.0		0	0.0		16	0.7		0	0.0		1,621	11.1	
94 Pregnancy	1,076	4.9	99.4							11	0.5	100.0				1,065	7.3	99.4
97 Parenthood	561	2.6	79.1							5	0.2	40.0				556	3.8	79.5
Other	2,483	11.4		136	9.7		130	4.8		181	8.2		136	7.6		1,996	13.7	
101 Dropped from strength, desertion	675	3.1	10.8	5	0.4	40.0	11	0.4	27.3	28	1.3	21.4	13	0.7	15.4	622	4.3	9.8
60 Character or behavior disorder	564	2.6	26.8	13	0.9	61.5	32	1.2	3.1	31	1.4	22.6	26	1.5	0.0	479	3.3	28.2
76 Homosexuality	360	1.7	31.1	7	0.5	57.1	28	1.0	28.6	42	1.9	38.1	17	1.0	11.8	278	1.9	29.9
22 Dependency or hardship	357	1.6	31.7	16	1.1	62.5	20	0.7	40.0	24	1.1	33.3	9	0.5	11.1	296	2.0	29.4
74 Fraudulent entry	192	0.9	22.9	59	4.2	33.9	28	1.0	14.3	19	0.9	21.1	52	2.9	7.7	78	0.5	20.5
99 Other	179	0.8	17.3	4	0.3	25.0	4	0.1	25.0	23	1.0	30.4	4	0.2	0.0	145	1.0	15.2
91 Erroneous enlistment or induction	64	0.3	28.1	26	1.9	42.3	2	0.1	50.0	6	0.3	33.3	13	0.7	15.4	25	0.2	16.0
98 Breach of contract	27	0.1	14.8	3	0.2	33.3				1	0.0	0.0	1	0.1	100.0	23	0.2	13.0
998 Invalid SPD	20	0.1	10.0				1	0.0	0.0	1	0.0	0.0				18	0.1	11.1
103 Record correction	15	0.1	33.3	3	0.2	0.0	3	0.1	33.3	6	0.3	16.7	1	0.1	0.0	3	0.0	100.0
90 Secretarial authority	11	0.1	9.1													11	0.1	9.1
105 Dropped from strength, other	7	0.0	0.0													7	0.0	0.0
96 Conscientious objector	5	0.0	0.0													5	0.0	0.0
999 Valid SPD with No ISC	3	0.0	0.0													3	0.0	0.0
72 Security	2	0.0	0.0													2	0.0	0.0
92 Sole surviving family member	2	0.0	0.0				1	0.0	0.0							1	0.0	0.0

Note. % = Percentage of all attrition in the given time period linked to each ISC. %F = percentage of attritees for each ISC that were female. Note, the female base rates for analysis samples are as follows: 19.6% (overall, 1st month), 19.0% (2nd month), 25.1% (AIT), 5.1% (OSUT), 17.8% (in-unit).

Based on these results, we decided to focus only on attrition linked to ISC 16 and ISC 87 for our aggregate analyses within IET time periods (i.e., BCT, AIT, OSUT). Thus, we created two additional variables—one reflecting ISC 16 attrition and one reflecting ISC 87 attrition. Soldiers who attrited for the target ISC (e.g. 87) during the given time period were treated as attritees, Soldiers who survived through that time period were treated as stayers, and Soldiers who attrited for any other reason were omitted. We excluded Soldiers who attrited for reasons other than the target ISC to ensure the reference group for analyses targeting a particular ISC consisted only of Soldiers considered to be stayers for the given time period (i.e., the comparison of attritees was relative to stayers, not the combined pool of other attritees and stayers). Thus, the reference group for all attrition criteria within a given period consisted of the same set of Soldiers.

Also of interest in Table 2.10 is the observation that moral character-related attrition accounts for nearly half of all in-unit attrition (46.2%). Historically, ISCs falling into the Moral Character and Performance categories shown in Table 2.10 have been combined under a heading "Failure to Meet Minimum Behavioral and Performance Criteria" (Laurence et al., 1995). However, recent work on moral character enlistment waiver policy in the Armed Services suggests utility in differentiating between these two types of ISCs (Putka, Noble, Becker, & Ramsberger, 2004). Specifically, Putka and his colleagues (2004) found that pre-service law violations and drug abuse were strongly related to moral character-related attrition, yet relatively unrelated to other types of attrition through 18 months of service.

Another observation of interest in Table 2.10 is the difference in representation by gender across different types of attrition. For example, in the overall analysis sample, only 9% of all Moral Character attritees were female, whereas 21.6% of attritees overall were female. Such findings are consistent with recent research that has found incidents of pre-service deviance (as evidenced by moral character enlistment waivers) and in-service deviance (e.g., in-service law violations) were more common among male Soldiers compared to females (Putka et al., 2004). Contrast such numbers with attritees for parenthood (ISC 97) and pregnancy (ISC 94), where 79.1% and 99.4% of attritees were female.[8] Such a pattern suggests that although gender is typically identified as a strong correlate of first term attrition (i.e., females more likely to attrit), such an effect may be diminished if one excludes attritees for reasons of pregnancy and parenthood (Laurence et al., 1995). Along these lines, Putka et al. (2004) found that gender was unrelated to moral character-related attrition, yet strongly related to other forms of attrition through 18 months of service, with female Soldiers about twice as likely to attrit (relative to males) for reasons other than moral-character-related ones.

For our aggregate analyses in the overall sample and in-unit time period, we created attrition criterion variables based on the types of attrition identified in Table 2.10. Soldiers who attrited for the target type (e.g., Moral Character, Performance, Medical/Physical) during the given time period were treated as attritees; Soldiers who survived through that time period were treated as stayers; and Soldiers who attrited for any other reason were omitted. Again, we excluded Soldiers who attrited for reasons other than the target type to ensure the reference group for analyses targeting a particular type of attrition consisted only of Soldiers considered to

[8] The fact that 6 men in the overall sample (0.6%) were identified as attritees for pregnancy clearly reflects an error in the recording of their official separation program designator (SPD) code in the EMF.

be stayers for the given time period. As such, the reference group for all types of attrition criteria within a given period consisted of the same set of Soldiers.

Coding of the Reenlistment Variable

Soldiers officially become eligible to reenlist for a second term of service 365 days prior to the expiration date of their first term of service. For our reenlistment analyses, we limited the research cohort to only those Soldiers who: (a) survived until the date corresponding to one year prior to their scheduled expiration-of-term of service (ETS date – 1 year), (b) had scheduled ETS dates that were on or before March 31, 2003 (the date through which our EMF records were current), and (c) did not leave service for a reason other than an expiration of term of service (ISC 1) prior to their scheduled ETS date. This resulted in a reenlistment analysis sample of 19,614 (31.5% of the 62,361 in our overall attrition analysis sample). We excluded Soldiers who attrited or left service for other reasons during the window one year prior to their scheduled ETS date because the Army excludes such Soldiers when calculating reenlistment rates.

When calculating reenlistment rates, the Army also excludes Soldiers deemed ineligible to reenlist based on reenlistment eligibility codes. However, for our analyses, such Soldiers *were included* in our reenlistment sample because as of October 1, 2001, we lacked reliable data on whether Soldiers in our sample were eligible for reenlistment. Prior to FY2002, the EMF contained a reenlistment eligibility variable reflecting eligibility *and* ineligibility codes. As of the FY2002 Quarter 1 EMF file, that variable became "historical" (i.e., no longer captured) and the variable it was replaced with, Reenlistment Prohibition, contained only ineligibility codes.[9]

Interestingly, we found that a number of Soldiers in our sample were *ineligible* to reenlist during time periods prior to FY2002 Quarter 1, but actually reenlisted at later points in time (suggesting they became eligible at a later time, but the new "prohibition" variable never reflected it). Examination of codes prior to FY2002 Quarter 1 suggested that Soldiers could indeed regain eligibility to reenlist after they had been ineligible in earlier time periods. The problem this created for determining Soldiers' reenlistment eligibility status is that we could not determine whether Soldiers who were ineligible as of FY2001 Quarter 4 became eligible at a later point in time. For those who reenlisted it was obvious, for those who did not reenlist, it was indeterminate. Simply put, as of FY2002 Quarter 1, we could not reliably determine if Soldiers in our reenlistment sample who failed to reenlist (yet completed their term of service) did so because they were ineligible or because they chose not to (i.e., we could not equate "system missing" values on the reenlistment prohibition variable with eligibility). For this reason, we decided to include all Soldiers who survived until the end of their term of service in our calculation of reenlistment rate. Inclusion of all such Soldiers (both eligible and ineligible) when calculating the reenlistment rate means that the rate we observed in our sample is *lower* than what it would be if we excluded Soldiers who completed their term of service yet were ineligible to reenlist.

[9] Subsequent research into the issue revealed that near the beginning of FY2002, the EMF was in the process of being integrated into PERSCOM's Total Army Personnel Database (TAPDB). As it turns out, there is a variable in the TAPDB that likely reflects Soldiers' enlistment eligibility (Enlisted Soldier Enlistment Eligibility), but this variable is not currently captured in the EMF.

To assess the impact that including potentially ineligible Soldiers had on our sample's reenlistment rate, we compared the rate for our sample to reenlistment rates (among first-term regulars) from previous fiscal years (see Table 2.11). The reenlistment rate in the FY1999 analysis sample was 49.3% (9,677 of 19,614 Soldiers). Surprisingly, this rate was slightly *higher* than most past rates captured between FY1981 and FY1996 (which are based only on reenlistment-eligible Soldiers).[10] Such findings suggest that despite including Soldiers ineligible to reenlist (in the denominator) our rate was still slightly on the high side. As we note above, had we been able to correctly exclude Soldiers who were ineligible for reenlistment from our sample, the observed reenlistment rate would have been even higher.

Table 2.11. Comparison of Reenlistment Rates from the Current Research and Past Fiscal Years

Cohort/Sample	Reenlistment Rate
FY 1999 analysis sample	49.3%
FY1996	39.6%
FY1995	49.5%
FY1994	49.2%
FY1993	42.2%
FY1992	33.9%
FY1991	45.3%
FY1990	49.6%
FY1989	49.2%
FY1988	48.5%
FY1987	42.1%
FY1986	41.1%
FY1985	43.1%
FY1984	40.3%
FY1983	40.9%
FY1982	57.9%
FY1981	55.0%

Note. Past fiscal year figures are based on unadjusted reenlistment rates for Army first-term regulars as reported by the Department of Defense. The rate for each fiscal year reflects the ratio of total reenlistments occurring in a given period to total separations of Soldiers eligible to reenlist in the same period (Source: Department of Defense Directorate for Information Operations and Reports, http://web1.whs.osd.mil/mmid/m01/sms221ar.htm).

[10] Unfortunately, as of the writing of this report, data on reenlistment rates among Army first-term regulars for FY1997 to FY2003 could not be found.

CHAPTER 3: COMPOSITION AND PREDICTION OF ATTRITION THROUGH 48 MONTHS OF SERVICE

Dan J. Putka

OVERVIEW

This chapter describes (a) the composition of attrition through 48 months of service (e.g., what types of attrition are most prevalent at various points in time), and (b) bivariate relationships between variables gathered prior to Soldiers' entry into IET and attrition through 48 months of service. Unlike subsequent chapters that use multivariate models to understand and predict attrition in the major time periods that define a Soldier's first term of service (i.e., BCT, AIT, OSUT, in-unit), we focus here on bivariate relationships only, with particular emphasis on how those relationships change across months of service. We chose not to examine multivariate models of attrition in this chapter because we felt that such models would change depending on the time period being examined (e.g., different variables will be most important for predicting BCT *v.* in-unit attrition). As such, we save the multivariate modeling work for later chapters. The primary questions we address in this chapter are:

1. Does the frequency or composition of attrition (e.g., moral character *v.* performance) vary by month in service? If so, how?
2. What pre-training variables have the strongest bivariate relationships with attrition?
3. Do bivariate relationships between pre-training variables and attrition depend on the type of attrition examined? If so, how?
4. Do bivariate relationships between pre-training variables and attrition vary by the month in service when attrition occurs? If so, how?

Answering these questions provides a context for the remaining chapters in this report. Answering the first question is important for understanding the nature of criteria being examined. Both theory and past empirical research suggest that different types of attrition are best predicted by different types of variables (e.g., Putka et al.'s [2004] work on moral character enlistment standards). Understanding what types of attrition are most prevalent at various points in time is a first step toward predicting attrition in each phase of a Soldier's first term of service.

Answering the remaining questions serves two purposes. First, it provides the Army with information on the validity of an assortment of pre-training variables for predicting various types of attrition through 48 months of service. Perhaps more important, it provides the Army with an understanding of how such variables may vary in their ability to predict attrition across the first term of service. Past work on first-term attrition in the Army has primarily focused on fixed attrition criteria (e.g., 12-month attrition status), rarely assessing the possibility that a predictor's relationship with attrition may vary depending on when such attrition occurred (see McCloy & DiFazio [1994] for an exception). Though this possibility is often acknowledged, little empirical work has been conducted to inform it (Laurence et al., 1996). In this chapter we assess the potential for time-varying effects among a very broad range of pre-training variables that might have utility to the Army for identifying recruits at risk for attrition.

METHOD

Sample

The sample examined in this chapter included all Soldiers in the research cohort, with the exception of those eliminated due to MOS training length issues cited in Chapter 2. Thus, the total number of Soldiers in the "overall" sample examined in this chapter was 62,631. As documented below, not all of these Soldiers had SRS or AIM data; thus, the sample sizes for many of the analyses were smaller than this figure.

Data

Predictor data examined in this chapter included: (a) demographic and background information from Army administrative records (e.g., gender, education, enlistment waivers), (b) SRS data gathered at reception battalions, and (c) AIM data for a subset of Soldiers gathered as they processed through their reception battalions. We refer to these data collectively as "pre-training" data because they were obtained from Soldiers prior to entering IET. The 62,631-member analysis sample included 28,471 with SRS data and 15,746 with AIM data. Table 3.1 shows the demographic composition of the three primary samples of data examined in this chapter relative to the full FY99 cohort.

Table 3.1. Demographic Composition of Analysis Samples vs. FY99 Cohort

	FY99 Cohort		Overall Sample		SRS Sample		AIM Sample	
Group	*N*	%	*n*	%	*n*	%	*n*	%
Gender								
Male	51,107	79.9	50,108	80.0	23,938	84.1	13,748	87.3
Female	12,823	20.1	12,253	19.6	4,533	15.9	1,998	12.7
Race								
White	38,361	60.0	37,329	59.6	17,827	62.6	10,009	63.6
Black	15,325	24.0	15,011	24.0	6,209	21.8	3,329	21.1
Hispanic	6,890	10.8	6,739	10.8	2,963	10.4	1,628	10.3
Other	3,354	5.2	3,282	5.2	1,472	5.2	780	5.0
AFQT Category								
I	2,306	3.6	1,949	3.1	863	3.0	593	3.8
II	18,799	29.4	18,101	28.9	8,390	29.5	4,589	29.1
IIIa	18,247	28.5	18,184	29.0	8,104	28.5	4,608	29.3
IIIb	22,447	35.1	22,054	35.2	10,430	36.6	5,297	33.6
IV-V	2,009	3.1	1,960	3.1	649	2.3	646	4.1
Education Tier								
1	55,432	86.7	53,921	86.1	24,800	87.1	12,153	77.2
2	7,966	12.5	7,929	12.7	3,420	12.0	3,465	22.0
3	285	0.4	276	0.4	149	0.5	54	0.3
Totals	63,938		62,631		28,471		15,746	

Note. SRS sample = Soldiers in overall sample with SRS survey data. AIM sample = Soldiers in overall sample with AIM data. Because demographic data were missing for a small number of Soldiers, subgroup sample sizes do not always sum to the "totals", and percentages do not always sum to 100%. Also note, actual analysis sample sizes may be smaller than the totals listed here due to missing survey data at the item-level.

Analyses

Composition of Attrition

To examine the distribution of attrition over time, we constructed a life table (Singer & Willett, 2003). The life table lists (a) the number of Soldiers who were in service as of the first day of each month of service, (b) the number who attrited during that month, (c) the percentage of Soldiers entering that month who attrited during that month (i.e., the *hazard* or conditional attrition rate for that month of service), and (d) other information (detailed later) that could facilitate understanding of the extent to which attrition occurs at various points across the first term. To examine the composition of attrition, we calculated the percentage of overall attrition falling into each of the attrition categories described in Chapter 2 (e.g., moral character, performance, medical/physical) for each month of service. Additionally, we report base rates of each type of attrition in the overall attrition analysis sample through 48 months of service.

Bivariate Relationships

A variety of analyses assessed bivariate relationships between the pre-training variables and attrition. Given the large number of variables available, analyses were limited to: (a) SRS and AIM composite variables, (b) SRS single items that did not appear in composites, and (c) all administrative variables (see Appendix D for a listing of variables examined). First, we calculated correlations between each variable and six attrition criteria:

- Overall attrition
- Moral Character attrition
- Performance attrition
- Medical/Physical attrition
- Pregnancy/Parenthood attrition
- Other attrition

When conducting these analyses, the coding of the specific types of attrition was such that Soldiers who attrited for reasons other than the focal type were omitted from the analyses. This was done so that the reference group for each type of attrition consistently comprised only Soldiers we considered to be stayers (not other types of attrits). Furthermore, depending on the scaling of the predictor variable examined, the correlations we calculated were either point-biserial correlations (for continuously-scaled predictors) or phi coefficients (for dichotomous predictors).

Because many administrative variables were categorical in nature, calculating the correlation between their observed values and attrition would not be meaningful (e.g., correlating race with attrition). As such we regressed (logistic) each attrition criterion on each administrative variable and saved the resulting predicted probabilities of attrition. We calculated correlations between these probabilities and the given attrition criterion to index each administrative variable's validity for predicting that type of attrition. It is important to note that unlike correlations reported for the SRS and AIM variables, these correlations only index *magnitude* of relationship, not its *direction*. Specifically, such predicted probabilities will always be positively correlated with attrition. Thus, for the most predictive administrative variables, we also report

odds ratios resulting from the logistic regression analyses. Odds ratios convey information regarding the magnitude and direction of the effect of a predictor (Hosmer & Lameshow, 2000).

Adjusted Correlations

Once the most salient predictors of each type of attrition were identified, we calculated *adjusted* correlations to estimate what the correlation between each predictor and attrition criterion would be if the base rate of attrition had been 50% (Kemery, Dunlap, & Griffeth, 1988). When base rates of attrition diverge from 50%, correlations that index its relationship with other variables are attenuated. The greater the base rate diverges from 50%, the more the correlation is attenuated. In this case, the attrition criteria examined all had quite different base rates. Kemery et al.'s (1988) method was used to adjust for base rate differences to meaningfully compare correlations for a given predictor across criteria.

c-Statistics

We also calculated a *c*-statistic for each predictor as an alternative index of its relation with attrition (Hanley & McNeil, 1983; Putka & McCloy, 2001). Arising from research on signal detection theory, the *c*-statistic ranges from 0 to 1 and indexes a predictor's ability to discriminate between attritees and stayers. Two characteristics of the *c*-statistic that make it beneficial in the present investigation are that (a) unlike the correlation coefficient it is invariant to base rate differences, and (b) it has a very simple interpretation. The *c*-statistic reflects the probability that an attritee will have a higher predicted probability of attrition than a stayer (based on use of the given predictor). Thus, a *c*-statistic of .50 indicates that an attritee is no more likely than a stayer to have a higher predicted probability of attrition (i.e., by using the given predictor, you are no better off than flipping a coin in terms of differentiating between attritees and stayers). On the other hand, a *c*-statistic of .70 indicates that attritees will have a higher predicted probability of attrition than stayers 70% of the time (again, based on use of the given predictor). Alternatively, one can interpret *c* as the proportion of times an attritee would have a higher predicted probability of attrition than a stayer if attritee/stayer pairs were repeatedly sampled from the population. In this research, the *c*-statistic was obtained by: (a) entering each predictor (separately) into a logistic regression model for predicting a given type of attrition, (b) saving the predicted probability of attrition based on using that predictor, and (c) calculating the *c*-statistic based on the predicted probability and the given attrition criterion using SPSS software.

Event History Analyses

Event history analyses (EHA) using discrete-time hazard models were employed to assess *if* and *how* each predictor varied in its relationship with overall attrition across 48 months of service (Singer & Willett, 2003). We decided to conduct EHAs on overall attrition only because we examine specific types of attrition in detail in subsequent chapters. Given that EHAs have rarely been used in past attrition research, we provide detail here on how these analyses were carried out.

Traditional logistic regression analyses model attrition on *person-level* data sets (i.e., a data set with one record per person). EHAs using discrete-time hazard models are conducted on *person-period* data sets, consisting of multiple records per person, one for each *time period* of interest. In this case, the time period of interest was month of service. As such, we created a data

file that had multiple records per Soldier, one for each month he/she was in service.[11] For example, if a Soldier attrited in his/her fourth month of service, than he/she would have four records in the data file. The attrition variable in this data file varied by month of service and indicated whether the Soldier attrited, or was still in service as of the end of each month. Thus, the Soldier in the previous example would have attrition variable values that were set to zero in their first three records (indicating s/he was still in service through three months), and a one in their fourth record (indicating s/he attrited in his/her fourth month of service).

Unlike values for the attrition variable, values for the predictor variables in this data file remained fixed for a Soldier across time periods. Because the goal of these EHA analyses was to assess if and how predictors gathered prior to training varied in their relationship with attrition over time, we did not allow their values to vary over time even when new versions of these variables became available in later surveys.

Parameterizing Time

Once the person-period data file was constructed, the next step in the event history analysis was to *parameterize* time. Paramaterizing time serves to describe what attrition rates look like across months of service (e.g., increasing, decreasing, U-shaped). Alternatively, one can think of it as identifying the "form" of the intercept to be used in subsequent EHA modeling efforts. When fitting a logistic regression model to attrition data in a person-level data set, there is only one intercept term, and it reflects the average attrition rate in the given sample. However, when fitting a discrete-time hazard model to a person-period data set, one can conceptualize many "intercepts" (e.g., one for each time period examined). These intercepts reflect the hazard (i.e., conditional attrition rate) in each time period.

In this case, we examined attrition across 48 months of service; consequently, a *completely general* parameterization of time would require use of 48 intercept terms in our models (i.e., one for each month of service). Fortunately, when constructing discrete-time hazard models, it is often unnecessary to have a completely general parameterization of time. Specifically, if one can identify a function that describes the relationship between time and the event of interest (e.g., attrition), one can allow that function to serve as the intercept in subsequent models. For example, if the attrition rate were constant across months of service, only one intercept term would be needed. If attrition rates simply decreased in a linear fashion across time, two terms would be needed–an intercept and a coefficient to index the downward trend as a function of month of service.

To determine an appropriate parameterization of time for the EHA models of attrition, we fitted a series of polynomial and piecewise functions of time that we felt best described the trend in hazards across months of service (as revealed by the life table). We assessed the fit of these simpler parameterizations of time against the completely general parameterization to identify a parameterization that was parsimonious, yet accurately described attrition rates over time. To assess differences in the fit, we conducted likelihood ratio tests and compared multiple fit criteria (e.g., Akaike's Information Criterion [AIC], Bayesian Information Criterion [BIC]; Singer & Willett, 2003).

[11] If a Soldier attrited in his/her first month of service, then he/she would only have one record in the data file.

Modeling the Effects of a Predictor Across Time

Upon identifying a parsimonious, well-fitting parameterization of time, the next step in the EHA was to enter each predictor into a hierarchical logistic regression equation for predicting attrition. One of the advantageous characteristics of discrete-time hazard models is that their parameters can be estimated using logistic regression procedures in widely available software packages (e.g., SPSS, SAS). As alluded to above, the difference is that the procedure is run on a person-period (as opposed to a person-level) data set, which has implications for the interpretation of the results (described below).

In the first step of the hierarchical model for each predictor, we entered the parameterization of time. Again, one can simply think of this as the intercept for the discrete-time hazard model. Predicted probabilities of attrition based on this step alone would basically reproduce the hazards for each month of service (i.e., the conditional monthly attrition rates). In a logistic regression analysis on a person-level data set, the predicted probability at this step would simply indicate the overall attrition rate in the given sample.

At the second step of the hierarchical model, we entered the given predictor. This step allowed us to assess whether the predictor had a significant "main" effect on attrition through 48 months of service. Predicted probabilities of attrition based on the first two steps provide us with a *hazard profile* (i.e., a pattern of hazards across months of service) for each score observed on the given predictor. If the predictor were positively related to attrition, then Soldiers with higher scores on the predictor would have hazard profiles that are elevated over the hazard profile resulting from Step 1 (i.e., the average hazard profile for the whole sample). Conversely, Soldiers with lower scores on the predictor would have hazard profiles that are lower than the average hazard profile. It is important to note that based on this step, changes in the risk for attrition (for any given month) associated with changes in a predictor are modeled as being *constant* across time. That is, the hazard profile for a Soldier with a given score on a predictor is simply lower or higher than the average profile, *but its shape is the same* (i.e., differences in hazards are proportional). In such a case, the effect of the predictor on attrition is said to be *fixed* across time. To test whether the effect of the predictor on attrition was indeed significant, we conducted likelihood ratio tests assessing the improvement in fit gained by adding the second step to the model (Singer & Willett, 2003).

Lastly, a third step tested whether the predictor's effect on attrition varied across months of service. In other words, it allowed us to determine if the effect of the predictor on attrition was *time varying*. At this third step, we entered a series of cross-product interaction terms by multiplying the predictor by a series of dummy variables representing various months in service. Details on the terms used in this equation will be presented later in this chapter. To test whether the effect of the predictor varied across time, we conducted likelihood ratio tests assessing the improvement in fit gained by adding the third step to the model (Singer & Willett, 2003).

While the likelihood ratio tests allow us to determine *if* the effect of a predictor varies over time, it does not reveal *how* it varies. To understand *how* predictors varied in their relationship with attrition over time, we reported odds ratios resulting from the above discrete-time hazard models. For models where predictors did not vary significantly across time, we only reported the odds ratio for the predictor from Step 2 of the models. For models where predictors

did vary significantly across time, we reported odds ratios for the predictor in each time period examined from Step 3 of the model. Doing so allowed us to observe *how* changes in odds of attrition associated with changes in a predictor varied across time.

Given that many of the survey variables were on different metrics, we presented standardized odds ratios for predictors with continuous response scales, and raw odds ratios for categorical predictors. To calculate a standardized odds ratio from analyses conducted on raw data, one simply multiplies the raw logistic regression coefficient for a given predictor by that predictor's sample standard deviation, and then exponentiates it (i.e., $e^{\beta s}$). Standardizing odds ratios for the continuous predictors was primarily done to facilitate interpretation. They can be interpreted as the change in odds of attrition associated with a single standard deviation change on the given predictor of interest. Odds ratios for categorical variables reflect the odds of attrition for the given group (e.g., Tier 2 Soldiers) relative to the odds of attrition for the reference group (e,g., Tier 1 Soldiers).[12]

To complement the odds ratio information, we calculated *c*-statistics within each of the 48 months of service based on predicted probabilities resulting from each predictor's model. For models where the effects of predictors did not vary significantly across time, we used predicted probabilities based only on the first two steps of the model (i.e., treating the effect of the predictor as fixed). For models where predictor impact did vary significantly across time, we used predicted probabilities based on the full model (i.e., treating the effect of the predictor as time varying). Reporting these *c*-statistics gave us an indication of how well a predictor discriminated between attritees and stayers in each time period.

RESULTS

Composition of Attrition Across Months of Service

Table 3.2 shows the life table for the overall attrition sample. The overall attrition rate through 48 months was 35.0%. More than half (51.1%) of all attrition occurred within the first 12 months of service, and nearly one-fifth (18.8%) occurred within the first two months of service. Soldiers were at greatest risk for attrition in their second month of service (Hazard = .044), accounting for 12.4% of all attrition. Based on these data, a Soldier's risk for attrition in any given month of service appears to peak in month 2, steadily decreases until month 8, and then remains fairly steady through 48 months of service. To help visualize the trend in hazards across time, Figure 3.1 shows the hazard profile for the overall sample, as well as for Soldiers who completed SRS and AIM . For each of these samples, the hazard spikes in the second month and then decreases steadily until about month 8, after which the hazard remains relatively constant with a slight bump upward between months 17 and 37. This pattern is remarkably similar to that of past research that has examined hazards of first term attrition by month of service (see Figure 5.2 in McCloy & DiFazio, 1994).

[12] The Army classifies recruits into three categories based on level of education. Tier 1 recruits are high school diploma graduates. Tier 2 recruits do not have a high school diploma, but do have an alternative education credential (e.g., GED). Tier 3 Soldiers are non-high school graduates with no alternative credential.

Table 3.2. Overall Sample Life Table

Month in Service	Total Entering	In-Service	Attrit	Hazard	Cumulative Attrition Rate	Proportion of All Attrition	Cumulative Proportion of All Attrition
1	62,361	60,957	1,404	.023	.023	.064	.064
2	60,956	58,257	2,699	.044	.066	.124	.188
3	58,255	56,417	1,838	.032	.095	.084	.272
4	56,412	55,181	1,231	.022	.115	.056	.329
5	55,168	54,183	985	.018	.131	.045	.374
6	54,141	53,413	728	.013	.142	.033	.407
7	53,347	52,857	490	.009	.150	.022	.430
8	52,806	52,432	374	.007	.156	.017	.447
9	52,388	52,032	356	.007	.162	.016	.463
10	51,982	51,626	356	.007	.168	.016	.480
11	51,578	51,239	339	.007	.173	.016	.495
12	51,186	50,845	341	.007	.179	.016	.511
13	50,793	50,483	310	.006	.184	.014	.525
14	50,447	50,099	348	.007	.189	.016	.541
15	50,059	49,709	350	.007	.195	.016	.557
16	49,668	49,340	328	.007	.200	.015	.572
17	49,299	48,919	380	.008	.206	.017	.589
18	48,872	48,476	396	.008	.213	.018	.608
19	48,419	47,984	435	.009	.219	.020	.628
20	47,932	47,466	466	.010	.227	.021	.649
21	47,410	46,952	458	.010	.234	.021	.670
22	46,892	46,462	430	.009	.241	.020	.690
23	46,395	45,963	432	.009	.248	.020	.709
24	45,880	45,429	451	.010	.255	.021	.730
25	44,308	43,891	417	.009	.262	.019	.749
26	43,811	43,431	380	.009	.268	.017	.767
27	43,360	42,924	436	.010	.275	.020	.787
28	42,855	42,485	370	.009	.281	.017	.804
29	42,417	42,016	401	.009	.288	.018	.822
30	41,947	41,533	414	.010	.294	.019	.841
31	41,440	41,019	421	.010	.301	.019	.860
32	40,937	40,527	410	.010	.307	.019	.879
33	40,452	40,132	320	.008	.313	.015	.894
34	40,045	39,711	334	.008	.318	.015	.909
35	39,526	39,219	307	.008	.323	.014	.923
36	39,030	38,698	332	.009	.328	.015	.938
37	24,529	24,338	191	.008	.331	.009	.947
38	24,257	24,107	150	.006	.334	.007	.954
39	24,058	23,914	144	.006	.336	.007	.961
40	23,851	23,693	158	.007	.339	.007	.968
41	23,640	23,495	145	.006	.341	.007	.974
42	23,449	23,321	128	.005	.343	.006	.980
43	23,269	23,156	113	.005	.345	.005	.985
44	18,896	18,792	104	.006	.346	.005	.990

Table 3.2. (Continued)

Month in Service	Total Entering	In-Service	Attrit	Hazard	Cumulative Attrition Rate	Proportion of All Attrition	Cumulative Proportion of All Attrition
45	15,638	15,565	73	.005	.348	.003	.994
46	12,921	12,866	55	.004	.348	.003	.996
47	9,716	9,664	52	.005	.349	.002	.998
48	7,947	7,914	33	.004	.350	.002	1.000
Total			21,813			1.000	

Note. Total Entering = Number of Soldiers in service at the start of the given month in service. In-Service = Number of Soldiers still in service at the end of the given month in service. Attrit = Number of Soldiers who attrited during the given month in service. Hazard = Proportion of Soldiers who entered the given month in service and attrited during that month (i.e., the conditional attrition rate for the given month). Cumulative Attrition Rate = Proportion of all Soldiers in the sample who attrited during or before the given month in service. Proportion of All Attrition = Proportion of all attritees in the sample who attrited during the given month in service. Cumulative Proportion of All Attrition = Proportion of all attritees in the sample who attrited during or before the given month in service.

Interestingly, according to the data, by month 8 approximately 94% of Soldiers had entered their unit (see Table 3.4). What this may appear to suggest is that Soldiers' risk for attrition is pretty constant once they enter their unit. However, caution should be taken in drawing such a conclusion based on these data, particularly with regard to Soldiers' hazards during their first several months in unit. Because Soldiers' time in IET varies as a function of MOS, without "re-starting time" once a Soldier enters his/her unit (i.e., redefining it in terms of months in *unit* rather than months *in service*), it is difficult to assess what Soldiers' hazard for *in-unit attrition* looks like in the first several months in-unit.[13] For example, as early as the fourth month of service, some Soldiers (22.5%) had already joined their units; thus, based on these data alone one cannot determine the attrition rate among Soldiers during their first month in-unit (i.e., it can't be assumed that all Soldiers' first month in unit occurred in their eighth month of service)

Hazard profiles for the SRS and AIM samples generally varied little from the overall sample. In all cases, the basic shapes of the profiles were similar. The primary differences were in the AIM sample, where some hazards were higher than hazards in the overall sample and SRS sample. Not surprisingly, these differences in the AIM hazard profile translated into a slightly higher overall attrition rate for the AIM sample (38.9%) compared to the overall sample (35.0%) and SRS sample (33.5%).

Next we turned to the composition of attrition by type. Table 3.3 provides base rates for the different attrition criteria through the first 48 months of service. Moral Character and Performance attrition had the highest base rates among specific types of attrition, followed closely by Medical/Physical attrition. Such a pattern is quite consistent with past research that has found the majority of first-term attrition (roughly 75 to 80 percent) can be attributed to the "failure to meet minimum behavioral or performance criteria" ISC grouping (Laurence et al., 1996).

[13] In the chapter devoted to in-unit attrition, time was re-started. Thus, we were able to examine Soldiers' hazard for in-unit attrition as a function of months in unit.

Table 3.3. Base Rates of Attrition through 48 Months of Service

Attrition Criterion	Base Rate
Overall attrition	35.0%
Moral Character attrition	15.0%
Performance attrition	12.4%
Medical/Physical attrition	12.3%
Pregnancy/Parenthood attrition	4.1%
Other attrition	6.0%

Table 3.4 shows the composition of overall attrition by month of service. Consistent with findings presented in Chapter 2, we found that Performance and Medical/Physical attrition accounted for the vast majority of attrition in the first two months of service. As discussed in Chapter 2, the majority of attrition in IET can be linked to two ISCs in particular (16: Medically Unqualified for Active Duty, Other, and 87: Entry Level Performance-Conduct/Trainee Discharge). Through six months of service, Performance and Medical/Physical attrition account for no less than 80% of the attrition that occurs. Beyond that, things change. Starting in month 7, we begin to see a steady increase in the occurrence of Moral Character attrition until about month 24, at which time it levels off, accounting for roughly 60% of attrition occurring between two and three years of service, and nearly 50% of attrition thereafter. Interestingly, during this same time period, Performance attrition steadily decreases, accounting for less than 5% of all attrition between two and three years of service. Such findings suggest that pre-training data assessing Soldiers' moral character (e.g., pre-service histories of deviance or trouble-making) may be more useful for predicting later attrition than early attrition. The event history analyses we present later will help evaluate this claim.

Another interesting finding in Table 3.4 regards Pregnancy/Parenthood attrition. Through eight months of service, this type of attrition is relatively rare, accounting for less than 5% of attrition in any given time period. After that however, as a percentage of total attrition it grows steadily until month 13. Between months 13 and 18, Pregnancy/Parenthood attrition accounts for roughly 16% of all attrition, which is more than either Performance or Medical/Physical attrition during that time period. Beyond 18 months, Pregnancy/Parenthood accounts for roughly 10% of overall attrition until month 36, after which it accounts for roughly 17.5% of attrition.

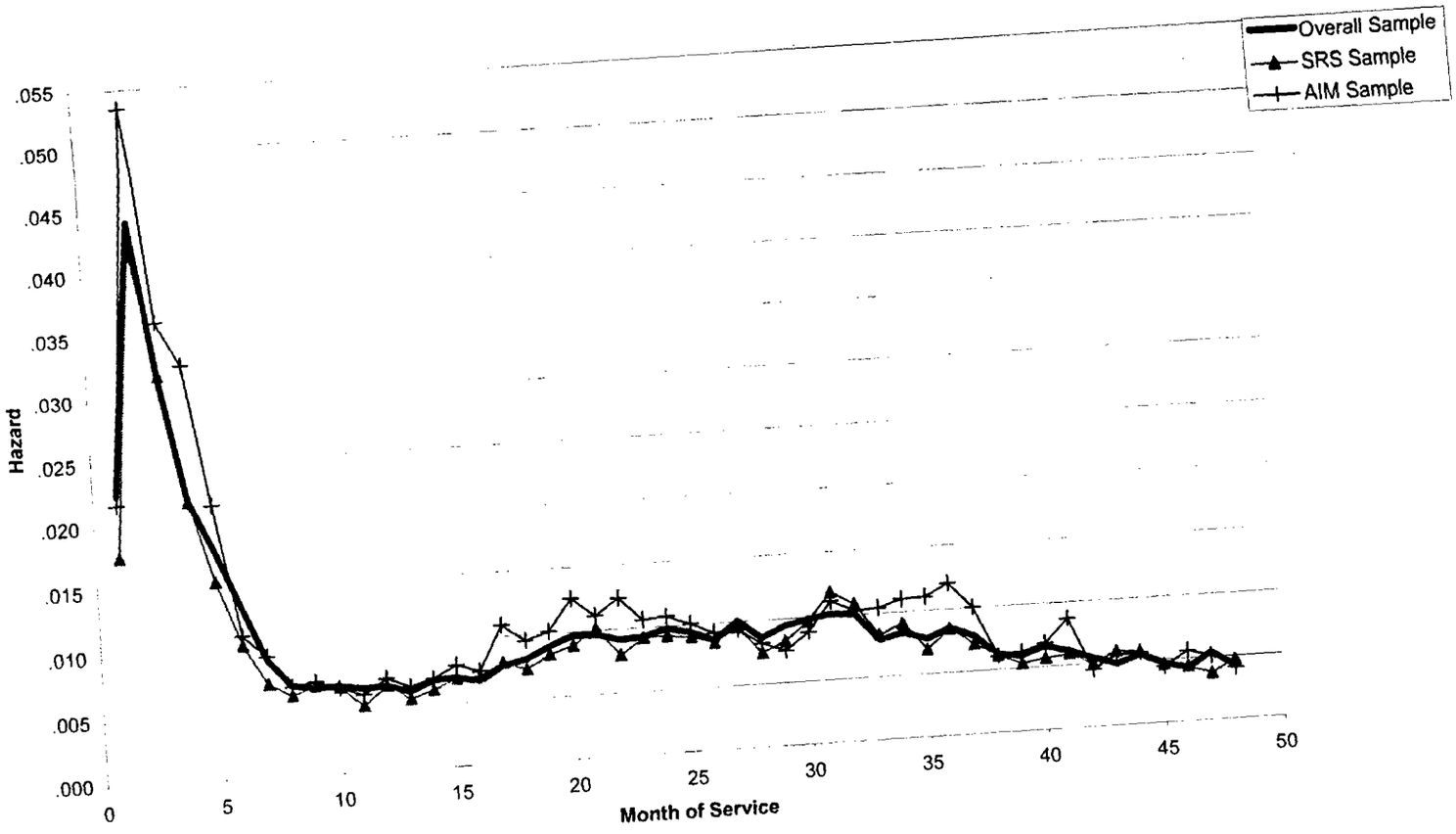

Figure 3.1. Hazard Profile by Month of Service and Sample

Table 3.4. Composition of Attrition through 48 Months of Service

Month in Service	% Soldiers in IET	Overall Attrit	Moral Character		Performance		Medical/Physical		Pregnancy/ Parenthood		Other	
			Attrit	% of Overall Attrit	Attrit	% of Overall Attrit	Attrit	% of Overall Attrit	Attrit	% of Overall Attrit	Attrit	% of Overall Attrit
1	100.0	1,404	0	0.0	653	46.5	615	43.8	0	0.0	136	9.7
2	100.0	2,699	4	0.1	1,333	49.4	1,232	45.6	0	0.0	130	4.8
3	100.0	1,838	8	0.4	844	45.9	899	48.9	1	0.1	86	4.7
4	77.5	1,231	8	0.6	685	55.6	451	36.6	3	0.2	84	6.8
5	39.9	985	22	2.2	567	57.6	312	31.7	9	0.9	75	7.6
6	23.4	728	32	4.4	432	59.3	181	24.9	17	2.3	66	9.1
7	11.8	490	69	14.1	224	45.7	127	25.9	7	1.4	63	12.9
8	5.4	374	68	18.2	106	28.3	103	27.5	14	3.7	83	22.2
9	3.2	356	88	24.7	77	21.6	79	22.2	28	7.9	84	23.6
10	2.5	356	102	28.7	46	12.9	84	23.6	41	11.5	83	23.3
11	1.5	339	123	36.3	33	9.7	66	19.5	35	10.3	82	24.2
12	0.7	341	127	37.2	40	11.7	53	15.5	48	14.1	73	21.4
13	0.1	310	117	37.7	32	10.3	32	10.3	53	17.1	76	24.5
14	0.0	348	158	45.4	17	4.9	44	12.6	53	15.2	76	21.8
15	0.0	350	170	48.6	17	4.9	46	13.1	49	14.0	68	19.4
16	0.0	328	158	48.2	16	4.9	36	11.0	61	18.6	57	17.4
17	0.0	380	212	55.8	15	3.9	38	10.0	66	17.4	49	12.9
18	0.0	396	227	57.3	9	2.3	42	10.6	55	13.9	63	15.9
19	0.0	435	232	53.3	22	5.1	58	13.3	51	11.7	72	16.6
20	0.0	466	279	59.9	7	1.5	61	13.1	56	12.0	63	13.5
21	0.0	458	273	59.6	18	3.9	47	10.3	48	10.5	72	15.7
22	0.0	430	246	57.2	20	4.7	54	12.6	53	12.3	57	13.3
23	0.0	432	257	59.5	20	4.6	51	11.8	40	9.3	64	14.8
24	0.0	451	284	63.0	12	2.7	50	11.1	51	11.3	54	12.0
25	0.0	417	253	60.7	13	3.1	35	8.4	59	14.1	57	13.7
26	0.0	380	208	54.7	11	2.9	48	12.6	54	14.2	59	15.5
27	0.0	436	274	62.8	14	3.2	43	9.9	50	11.5	55	12.6

Table 3.4. (Continued)

Month in Service	% Soldiers in IET	Overall Attrit	Moral Character		Performance		Medical/Physical		Pregnancy/ Parenthood		Other	
			Attrit	% of Overall Attrit	Attrit	% of Overall Attrit	Attrit	% of Overall Attrit	Attrit	% of Overall Attrit	Attrit	% of Overall Attrit
28	0.0	370	240	64.9	16	4.3	38	10.3	37	10.0	39	10.5
29	0.0	401	266	66.3	13	3.2	28	7.0	48	12.0	46	11.5
30	0.0	414	280	67.6	10	2.4	46	11.1	37	8.9	41	9.9
31	0.0	421	282	67.0	8	1.9	34	8.1	61	14.5	36	8.6
32	0.0	410	253	61.7	19	4.6	38	9.3	50	12.2	50	12.2
33	0.0	320	203	63.4	12	3.8	38	11.9	40	12.5	27	8.4
34	0.0	334	197	59.0	17	5.1	42	12.6	43	12.9	35	10.5
35	0.0	307	187	60.9	11	3.6	36	11.7	41	13.4	32	10.4
36	0.0	332	212	63.9	16	4.8	20	6.0	35	10.5	49	14.8
37	0.0	191	99	51.8	8	4.2	23	12.0	33	17.3	28	14.7
38	0.0	150	62	41.3	7	4.7	23	15.3	37	24.7	21	14.0
39	0.0	144	85	59.0	6	4.2	20	13.9	20	13.9	13	9.0
40	0.0	158	87	55.1	9	5.7	21	13.3	26	16.5	15	9.5
41	0.0	145	72	49.7	8	5.5	28	19.3	26	17.9	11	7.6
42	0.0	128	63	49.2	5	3.9	20	15.6	26	20.3	14	10.9
43	0.0	113	58	51.3	6	5.3	22	19.5	17	15.0	10	8.8
44	0.0	104	54	51.9	3	2.9	18	17.3	23	22.1	6	5.8
45	0.0	73	41	56.2	3	4.1	5	6.8	15	20.5	9	12.3
46	0.0	55	29	52.7	1	1.8	14	25.5	6	10.9	5	9.1
47	0.0	52	24	46.2	6	11.5	6	11.5	10	19.2	6	11.5
48	0.0	33	17	51.5	4	12.1	5	15.2	4	12.1	3	9.1
Totals		21,813	6,810	31.2	5,471	25.1	5,412	24.8	1,637	7.5	2,483	11.4

Note. % of Soldiers in IET = Percentage of Soldiers in IET in the given month of service. Overall Attrit = Number of Soldiers who attrited during the given month in service. The number of Soldiers who separated for each type of attrition in a given month of service is noted in the "Attrit" column under each type. The percentage of all Soldiers who separated for each type of attrition in a given month of service is noted in the "%" column under each type.

Bivariate Relationships between Pre-Training Variables and Attrition

Overall Attrition

Table 3.5 presents raw (unadjusted) correlations and *c*-statistics for administrative variables, single-item SRS variables, and SRS and AIM composites[14]. Only variables that had correlations of .05 or greater in magnitude with overall attrition are presented.[15] These results reveal that predictor-attrition relations were generally modest, with all single variables and composites correlating with attrition between +/- .15.

Among administrative variables, gender was the best predictor of overall attrition, followed closely by education tier. Logistic regression analyses revealed the odds of attrition for females were 2.08 times greater than the odds of attrition for males, and the odds of attrition for Tier 2 Soldiers were 2.06 times greater than the odds of attrition for Tier 1 Soldiers. Interestingly, we found the odds of attrition for Tier 3 Soldiers were not significantly higher than the odds of attrition for Tier 1 Soldiers (*OR* = 1.22, *ns*), suggesting that the small numbers of Tier 3 Soldiers allowed entry into the Army are carefully screened. These findings are consistent with past research, which has identified education tier and gender as two of the strongest predictors of first-term attrition (Laurence et al., 1996).

Several survey variables achieved levels of prediction that were on par, or slightly better than, that of gender and education tier. For example, several of the most predictive survey variables reflected juvenile deviance (e.g., SRS Item 42: Pre-DEP smoking, SRS Trouble in School, AIM Dependability[16]). Several variables reflecting pre-service attitudes or beliefs also appeared to be predictive of overall attrition (e.g., SRS Attrition Cognitions, SRS Generalized Self Efficacy, SRS Item 58: Level of stress/strain). Variables reflecting past withdrawal (or conversely, past completion) tendencies fared well (e.g., SRS Thoughts of Quitting High School, SRS Reasons for Quitting Jobs, SRS Item 5: How long in DEP). Lastly, variables that could be viewed as indicators of pre-training levels of physical fitness (e.g., SRS Item 35: Average fitness level before Army, AIM Physical Conditioning) also predicted overall attrition. Given the heterogeneous nature of the overall attrition criterion, the emergence of a variety of factors as salient predictors is not surprising. Subsequent sections help reveal the types of attrition for which the aforementioned factors are most predictive, and reveal whether new variables emerge as predictive of these more specific criteria.

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[14] In this and subsequent tables, refer to the survey booklets in Appendix A for the precise wording of the questions in the various surveys. In each table, we identify the survey and the question/response option number, and provide only a very short extract. The wording of the question stem is often crucial to understanding that extract.

[15] Given the large number of predictors we examined in this chapter (more than 100), we decided to present results only for those predictors that had correlations with attrition that were of at least .05 in magnitude. This decision was made for several reasons: (a) the excluded predictors shared no more than one-quarter of one-percent (0.25%) of their variance with the attrition criterion; (b) each of these variables would be reevaluated in later chapters that focus on attrition during each major period of a Soldier's first term of service; and (c) the goals of this chapter were on identifying the top predictors. Thus, we limited presentation of our results to predictors we believed showed most promise.

[16] Based on its pattern of correlations with other variables, low scorers on AIM Dependability appeared to be individuals who had problems with authority and/or following rules. This is consistent with past Army work in which the negative pole of Dependability has been associated with deviance (Knapp, 2003).

Table 3.5. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Overall Attrition

Predictor	*n*	*r*	*c*	SE_c
Administrative				
Gender	60,384	.14	.560	.002
Education Tier	60,154	.12	.542	.002
Pay Grade at Entry	60,384	.09	.542	.002
Race/Ethnicity	60,384	.08	.540	.002
Enlistment Term at Entry	60,174	.07	.528	.002
High Quality Recruit	60,384	.06	.534	.002
AFQT Category	60,277	.06	.532	.002
Number of Dependents at Entry	60,384	.05	.517	.002
SRS Single Items				
42. How often smoke before DEP	27,484	.15	.575	.004
25a. Never thought about quitting HS	27,025	-.15	.573	.004
05. How long in DEP	27,270	-.12	.570	.004
35. Average fitness level before Army	27,528	-.10	.554	.004
24. Were you ever suspended	22,779	.09	.548	.004
58. Level of stress/strain	27,490	.09	.555	.004
23. Were you ever expelled	22,773	.08	.520	.004
02d. Wife/Husband/Girlfriend/Boyfriend	26,343	.07	.530	.004
22a. Never sent to principal's office	27,058	-.07	.534	.004
52. Advise male about joining Army	27,374	-.06	.521	.004
20. Average grades in high school	27,325	-.05	.526	.004
59. Current level of morale	27,494	-.05	.521	.004
SRS and AIM Composites				
SRS Thoughts of Quitting High School	27,025	.15	.577	.004
AIM Physical Condition	15,122	-.13	.574	.005
SRS Trouble in School	27,058	.12	.564	.004
SRS Attrition Cognitions	27,570	.12	.548	.004
AIM Dependability	15,096	-.12	.568	.005
SRS Generalized Self Efficacy	27,543	-.11	.545	.004
AIM Agreeableness	15,119	-.10	.554	.005
AIM Adjustment	15,104	-.10	.555	.005
SRS Reasons for Quitting Previous Jobs	27,337	.09	.552	.004
SRS Reasons for Leaving Army - Problems Adjusting	27,389	.08	.541	.004
AIM Work Orientation	15,112	-.08	.544	.005
SRS Reasons for Leaving Army - All Reasons	27,509	.07	.544	.004
SRS Affective Commitment	27,546	-.06	.527	.004
SRS Reasons for Leaving Army - Deviance	27,325	.05	.520	.004
SRS Reasons for Joining Army - Escape Problems	27,450	.05	.529	.004
SRS Core Army Values - Loyalty, Selfless Service	27,535	-.05	.518	.004
SRS Participation in DEP Activities	27,393	-.05	.529	.004

Note. r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r and c-statistics are significant ($p < .05$, one-tailed). Within each category, predictors are sorted in descending order by magnitude of their correlation with attrition.

Comparison of Bivariate Relationships Across Types of Attrition

Given the differences in base rates across different attrition criteria apparent in Table 3.3, we focus subsequent discussion of bivariate relationships on adjusted correlations between predictor variables and criteria. For reference, raw correlations between predictor variables and each type of attrition are presented in Appendix E.

Administrative Variables

Table 3.6 provides evidence that administrative variables perform differently across criteria. For example, education tier appeared to predict Moral Character attrition better than the other types of attrition– not being predictive of Pregnancy/Parenthood attrition whatsoever. Logistic regression analyses revealed the odds of Moral Character attrition for Tier 2 Soldiers were 2.74 times greater than the odds of such attrition for Tier I Soldiers. As was the case with overall attrition, we found that the odds of Moral Character attrition for Tier 3 Soldiers were not significantly higher than the odds of such attrition for Tier 1 Soldiers (OR = 1.37, *ns*). In contrast, logistic regression analyses revealed the odds of Performance and Medical/Physical attrition for Tier 2 Soldiers were 2.02 and 1.67 times greater (respectively) than the odds of such attrition for Tier 1 Soldiers. Again, the odds of these types of attrition for Tier 3 Soldiers were not significantly different from those of Tier 1 Soldiers

Also of note is the functioning of gender as a predictor. Aside from attrition for reasons of pregnancy or parenthood, gender was far more predictive of Performance attrition compared to the other types of attrition. Logistic regression analyses revealed that the odds of Performance attrition among females were 2.75 times greater than the odds of such attrition for males. In contrast, the odds of Medical/Physical and Other attrition among females were 1.99 and 1.63 times greater (respectively) than the odds of such attrition for males. Interestingly, the relationship between gender and Moral Character attrition was not only weaker than the relationship between gender and other types of attrition, it was reversed. Specifically, logistic regression revealed the odds of Moral Character attrition for *males* were 1.79 times greater than the odds of such attrition for females. These findings are consistent with Putka et al.'s (2004) findings on moral character-related attrition. They also illustrate how previous studies that have combined Moral Character and Performance attrition into one category (i.e., "failure to meet minimum behavioral or performance criteria") have likely masked gender's differential relationship with these criteria.

Additionally, the functioning of two variables that play a prominent role in Soldier selection--namely, AFQT category and the high-quality recruit designation (which reflects both AFQT category and education tier information)--are worth noting. The high-quality recruit variable was predictive of only Moral Character and Performance attrition, and its effect was relatively modest. Logistic regression analyses revealed that the odds of Moral Character and Performance attrition for low quality recruits were 1.61 and 1.40 times greater (respectively) than the odds of such attrition for high quality recruits. Based on adjusted correlations, AFQT category was nearly equally predictive of all types of attrition, being slightly more predictive of Moral Character, Performance, and Pregnancy/Parenthood attrition. Table 3.7 presents odds ratios for AFQT category with each type of attrition. Soldiers with lower AFQT scores appear to be at notably greater risk for attrition across all categories (with the exception of Other attrition).

Table 3.6. Adjusted Correlations between Different Types of Attrition and Top Pre-Training Predictors

		Type of Attrition				
Predictor	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
Administrative						
Gender	.15	.08	.20	.13	.72	.08
Education Tier	.12	.18	.11	.08	.01	.11
Pay Grade at Entry	.09	.11	.09	.07	.04	.04
Race/Ethnicity	.09	.08	.08	.11	.05	.05
Enlistment Term at Entry	.07	.06	.05	.05	.17	.07
High Quality Recruit	.07	.10	.07	.03	.01	.02
AFQT Category	.06	.07	.06	.04	.06	.04
Number of Dependents at Entry	.05	.02	.04	.05	.10	.08
Marital Status at Entry	.04	.01	.04	.05	.11	.07
Medical Failure: Weight	.04	.00	.04	.08	.05	.00
CDC BMI Category	.03	.03	.02	.10	.11	.01
Medical Failure: Drugs	.03	.07	.00	.01	.02	.01
Enlistment Waiver	.02	.08	.01	.05	.05	.02
CMF Category	.02	.09	.06	.04	.25	.04
Moral Character Enlistment Waiver	.02	.06	.00	.01	.04	.00
MOS Category (CA, CS, CSS)	.01	.07	.06	.03	.22	.01
SRS Single Items						
25a. Never thought about quitting HS	-.16	-.18	-.16	-.11	-.02	-.12
42. How often smoke before DEP	.15	.20	.12	.11	.02	.08
05. How long in DEP	-.12	-.11	-.12	-.11	-.06	-.09
35. Average fitness level before Army	-.10	-.01	-.15	-.14	-.14	-.02
24. Were you ever suspended	.09	.18	.06	.04	-.06	.03
58. Level of stress/strain	.09	.01	.13	.13	.05	.07
23. Were you ever expelled	.08	.14	.08	.04	-.01	.03
02d. Wife/Husband/Girlfriend/Boyfriend	.07	.07	.06	.06	.11	.05
22a. Never sent to principal's office	-.07	-.14	-.05	-.04	.09	-.02
52. Advise male about joining Army	-.06	-.02	-.10	-.07	.03	-.07
21. College when enlistment term is up	-.05	-.06	-.05	-.05	.06	-.01
20. Average grades in high school	-.05	-.10	-.05	-.02	.11	-.02
59. Current level of morale	-.05	.00	-.10	-.09	.05	-.03
37. Medical advice against exercise	.04	.02	.02	.09	-.01	.01
43. How often drink alcohol before DEP	.04	.09	.01	.02	-.06	.01
36. # Serious injuries before Army	.04	.02	.02	.08	-.04	.03
02a. Parent(s)/Guardian(s)	.03	.06	.02	.01	.01	-.01
53. Advise female about joining Army	-.03	.00	-.06	-.03	.05	-.04

Table 3.6. (Continued)

Predictor	Overall	Type of Attrition: Moral	Perform	Med/ Phys	Preg/ Parent	Other
39. Moral waiver needed to join Army	.02	.06	.01	.00	-.05	.01
47. Work I enjoy most is available	-.02	.04	-.06	-.04	-.08	-.01
40. Medical waiver needed to join Army	.01	-.01	.00	.06	.00	-.01
SRS and AIM Composites						
SRS Thoughts of Quitting High School	.15	.18	.16	.12	.01	.12
SRS Trouble in School	.13	.21	.12	.08	-.08	.04
AIM Physical Condition	-.13	-.07	-.18	-.15	-.08	-.06
SRS Attrition Cognitions	.12	.02	.20	.18	.04	.10
AIM Dependability	-.12	-.18	-.12	-.07	.09	-.09
SRS Generalized Self Efficacy	-.11	.02	-.18	-.18	-.10	-.08
SRS Reasons for Quitting Previous Jobs	.10	.08	.06	.11	.05	.07
AIM Agreeableness	-.10	-.10	-.13	-.07	.04	-.07
AIM Adjustment	-.10	-.05	-.14	-.12	.01	-.07
SRS Reasons for Leaving Army - Probl. Adjusting	.08	.02	.13	.10	.02	.07
SRS Reasons for Leaving Army - All Reasons	.08	.02	.11	.10	.02	.05
AIM Work Orientation	-.08	-.08	-.11	-.08	.07	-.02
SRS Affective Commitment	-.06	-.01	-.10	-.07	-.01	-.05
SRS Reasons for Leaving Army - Deviance	.05	.05	.07	.05	-.03	.03
SRS Reasons for Joining Army - Escape Problems	.05	.09	.05	.01	-.03	.04
SRS Core Army Values - Loyalty, Selfless Service	-.05	-.04	-.09	-.02	-.01	-.02
SRS Participation in DEP Activities	-.05	-.05	-.05	-.05	-.03	-.03
SRS Military vs. Civilian – Pay	.04	.06	.04	.01	.11	-.01
SRS Core Army Values - Duty, Integrity, Courage	-.03	-.02	-.08	-.03	.08	-.02
AIM Dominance	.01	.00	-.02	.03	.12	.00
SRS Participation in High School Activities	.00	-.01	-.05	.01	.10	.01

Note. Values in cells are adjusted correlations (Kemery et al., 1988) between the given predictor and the given attrition criterion. They provide an estimate of what the correlation would be if the base rate of attrition were .50. Within each category, predictors are sorted in descending order by magnitude of their correlation with *overall* attrition (*q.v.*, Table 3.4). Correlations are highlighted if their value is at least .05 in magnitude.

Lastly, a review of the other administrative variables in Table 3.6 reveals relationships that are consistent with expectations. For example, receipt of a moral character enlistment waiver or medical failure for drugs was related to Moral Character attrition, but unrelated to other forms of attrition. Marital status and number of dependents at entry were related to Pregnancy/ Parenthood attrition, but relatively unrelated to the other types of attrition (exception, Other attrition). Medical failure for weight and body mass index (BMI) were related to Medical/ Physical attrition, but relatively unrelated to other forms of attrition (exception, Pregnancy/Parenthood).

Table 3.7. Odds Ratios for AFQT Category by Attrition Type

		Type of Attrition				
Predictor	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
AFQT Category (Cat I)						
Cat II	**1.54**	**1.61**	**1.71**	**1.49**	**2.27**	1.10
Cat IIIa	**1.94**	**2.21**	**2.12**	**1.76**	**2.84**	**1.27**
Cat IIIb	**1.77**	**2.12**	**2.11**	**1.50**	**2.41**	1.01
Cat IV	**1.46**	**1.51**	**1.89**	**1.44**	1.18	0.95

Note. Reference group is Category I Soldiers. Bolded values are statistically significant ($p < .05$).

Interestingly, the direction of BMI category's relationship with Medical/Physical and Pregnancy/Parenthood was strikingly different. Logistic regression revealed that the odds of Medical/Physical attrition for underweight, overweight and obese Soldiers were 1.33, 1.32, and 2.13 times greater (respectively) than the odds of such attrition for Soldiers in the normal BMI category. Conversely, logistic regression revealed that compared to Soldiers in the normal BMI category, underweight Soldiers were 1.65 times *more* likely to attrit for Pregnancy/Parenthood, overweight Soldiers were 1.48 times *less* likely to attrit for such reasons, and lastly obese Soldiers were 7.04 times *less* likely to attrit for such reasons. Given that Pregnancy attrition has traditionally been considered as Medical attrition in past work, these findings reveal that such a practice may mask BMI category's differential relationship with these criteria.

Survey Variables

A review of the survey variables in Table 3.6 reveals a pattern of findings that was quite consistent with expectations. Variables assessing various aspects of juvenile deviance (e.g., smoking/drinking behavior before DEP, suspensions/expulsions from school, trips to the principal's office, trouble in school) were most predictive of Moral Character attrition. Conversely, variables reflecting pre-service medical condition (e.g., SRS Item 37: Medical advice against exercise, SRS Item 36: Number of serious injuries before Army) were related to Medical/Physical attrition and unrelated to other forms of attrition. Interestingly, variables reflecting pre-service physical condition (e.g., SRS Item 35: Average fitness level before Army, AIM Physical Conditioning) showed relationships with both Performance and Medical/Physical attrition, but were unrelated to other forms of attrition.

Also of note was that that attitudinal variables such as SRS Attrition Cognitions, SRS Generalized Self Efficacy, and SRS Item 58 (Level of stress/strain) were most related to Performance and Medical/Physical attrition (and curiously, unrelated to Moral Character attrition), suggesting that recruits' concerns over the physical demands of the Army or their medical history may underlie their pre-training ratings on these variables. Lastly, it is worth noting that variables reflecting a good fit between the individual and the Army (e.g., SRS Core Army Values, SRS Affective Commitment, SRS Item 47: Work I enjoy is most available in the Army) were most related to Performance attrition.

Assessing the Effects of Predictors Over Time

Although the analyses above provide insight into the bivariate relationships between pre-training variables and attrition through 48 months of service, they do not speak to the stability of those relationships across time. In this section we examine *if* and *how* the relationships observed above change as a function of the month of service when attrition occurs.

Parameterizing Time

As described earlier, to test for potential time varying effects of each pre-training variable, we constructed discrete-time hazard models. The first step in this process was to determine an appropriate parameterization of time for use in these models. Table 3.8 shows model fit statistics for different parameterizations of time we fitted to the data.

The first column in Table 3.8 shows the type of parameterization of time fitted to the data. As Singer and Willett (2003) suggest, we began by fitting an ordered series of polynomial parameterizations of time, and then proceeded to fit two piecewise functions that best matched the hazard profile for the overall sample (depicted in Figure 3.1). The completely general parameterization of time, consisting of one dummy variable for each of the 48 months of service, is the standard against which other potential parameterizations were compared. No parameterization can fit better than the general parameterization (in terms of –2LL), but other parameterizations can provide similar levels of fit with far fewer parameters. Accordingly, the second column in Table 3.8 shows the number of parameters (*df*) in each model we examined. The third column provides the deviance or –2 log likelihood (-2LL) statistic for the model, which indexes fit (smaller is

Table 3.8. Model Fit Statistics for Different Parameterizations of Time in the Overall Sample

Parameterization of Time	*df*	Deviance (-2LL)	*G* *v.* Previous Model	*G* *v.* General Model	AIC	BIC	PI (-2LL)	PI (BIC)
Polynomial								
Constant	1	239,953	-	8355	239,955	239,964	0.00	0.00
Linear	2	236,339	3615	4740	236,343	236,361	0.43	0.46
Quadratic	3	235,022	1316	3424	235,028	235,056	0.59	0.63
Cubic	4	233,141	1882	1542	233,149	233,185	0.82	0.87
Quartic	5	233,043	98	1444	233,053	233,098	0.83	0.88
Quintic	6	232,843	200	1244	232,855	232,909	0.85	0.90
Piecewise								
PW1	4	232,091	752	492	232,099	232,135	0.94	1.00
PW2	6	231,703	388	104	231,715	231,769	0.99	1.05
General	48	231,599	-	-	231,695	232,129	1.00	1.00

Note. PW1 = Piecewise function 1, defined with: one dummy indicator for month 1, a linear trend between months 2 and 7, and one dummy indicator for months 8 through 48. PW2 = Piecewise function 2, defined with: one dummy indicator for month 1, a linear trend between months 2 and 7, one dummy indicator for months 8 through 16, one dummy indicator for months 17 through 37, and one dummy indicator for months 38 through 48 (see Appendix F for further details on this function).

better). The fourth and fifth columns show likelihood ratio test statistics (G), which index the fit of the given model against the previous model in the table and the completely general model (respectively).[17] The six and seventh columns show Akaike's Information Criterion (AIC) and the Bayesian Information Criterion (BIC), which provide indexes of model fit (based on –2LL) that are penalized for the number of parameters in the model (smaller is better, BIC imposes a steeper penalty for more parameters; Singer & Willett, 2003). The last two columns in Table 3.8 show statistics that index the improvement in model fit that occurs through use of the given parameterization. The statistics are calculated for two types of fit indexes –2LL and BIC. Essentially, these statistics index the improvement in model fit gained by using the given parameterization of time over the constant parameterization (the worst fitting model) *relative to* improvement in model fit gained by using the general parameterization of time (the best fitting model) over the constant parameterization. For any given parameterization of time they are calculated as:

PI (Fit Index) = [Fit Index (Constant Parameterization) - Fit Index (Target Parameterization)] /
[Fit Index (Constant Parameterization) - Fit Index (General Parameterization)]

The fit indexes (–2LL or BIC) for the models serve as input into this equation, and PI stands for proportion of improvement. The constant parameterization will always provide the worst fit to the data because it models attrition rate as a constant across months. The general parameterization will always provide the best fit because it is completely saturated. Thus, this statistic provides a meaningful metric for judging the relative fit of one model against each other, as well as the general model.

For the most part, we relied on the PI statistics to identify the parameterization of time we used in the subsequent EHA models. Specifically, the goal was to identify a model that captured nearly all the improvement in fit that the general specification offered over the constant specification, but did so with far fewer parameters. Although none of the polynomial parameterizations of time accounted for more than 90% of the improvement in fit achieved by using the general model (relative to the constant), the second piecewise model we fitted (PW2), accounted for 99% of the difference in fit between the constant and general model (based on -2LL). Furthermore, the BIC statistic for the second piecewise model was actually better (lower) than that of the general model [thus, the PI(BIC) value of 1.05]. Given that the second piecewise model fitted the data equally as well with only six parameters (as opposed to the general model's 48), we chose to use this piecewise parameterization of time in the subsequent EHA modeling effort. Appendix F contains further technical details on the parameterization of the EHA models. Figure 3.2 provides a graphical depiction of the PW2 model along with the hazard profile for the overall sample for comparison.

[17] G is calculated by taking the difference between deviance statistics for the two models being compared. It is chi-squared distributed with df equal to the difference in the number of parameters for the two models. It is only appropriate to use when comparing nested models.

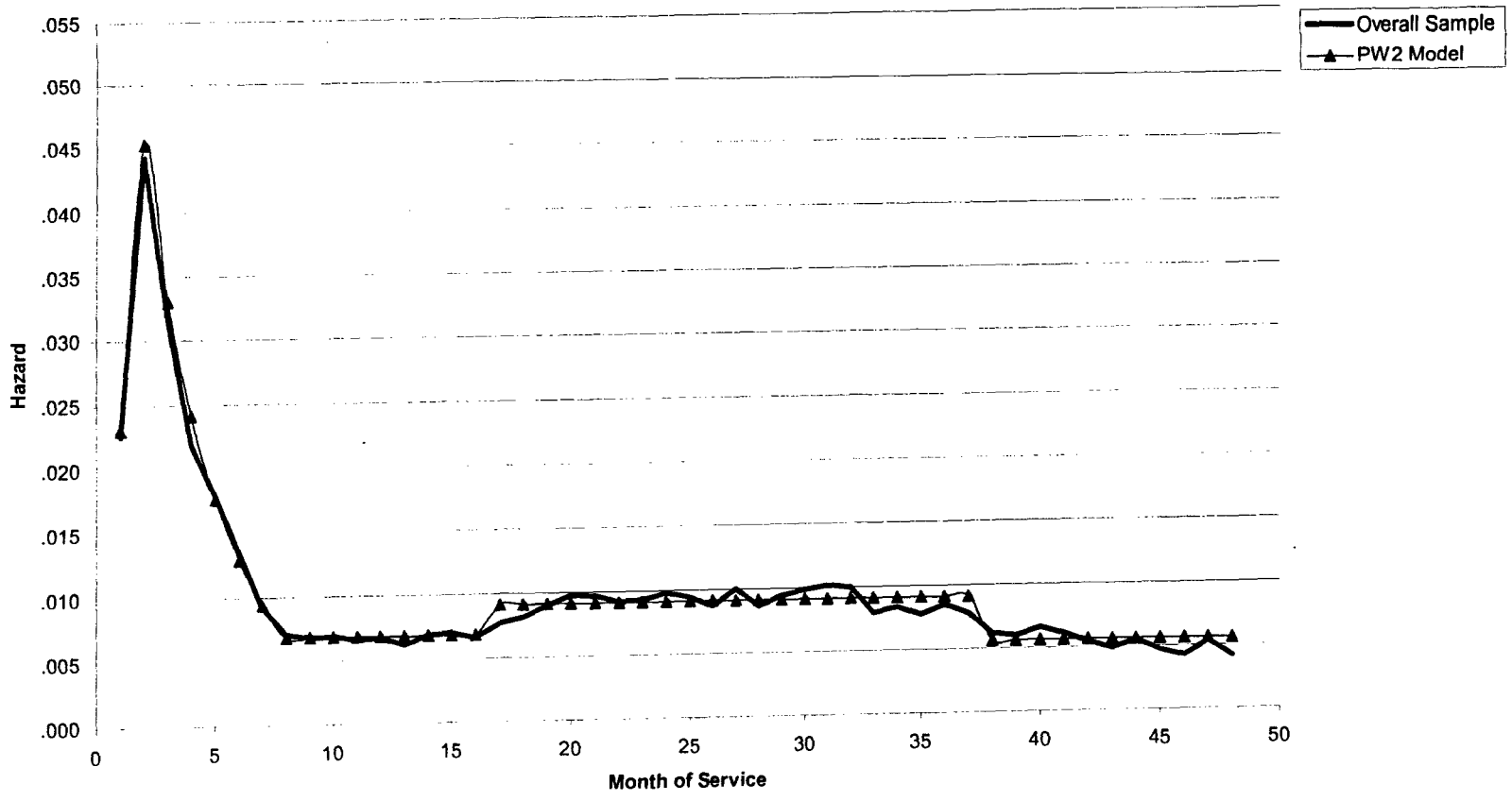


Figure 3.2. Hazard Profile for the Overall Sample and PW2 Model

Testing for Time Varying Effects

Upon identifying an appropriate parameterization of time, we proceeded to fit a hierarchical discrete-time hazard model for each predictor, assessing *if* and *how* its effect on attrition varied over time. Table 3.9 displays the fit statistics for variables that either (a) had an unadjusted correlation with overall attrition (in the aggregate sample) of at least .05 in magnitude or (b) had a *c*-statistic in any month of service summarized in Table 3.10 that was at least .55 in magnitude (at least 10% greater than chance discrimination of attritees/stayers).

Table 3.9. Model Fit Statistics for Assessing Time Varying Effects of Predictors of Overall Attrition

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 v. 3	PI (-2LL) Step 3
Administrative					
Time Varying					
Gender	231,703	230,496	230,215	281	.19
Education Tier	230,602	229,678	229,628	50	.05
Pay Grade at Entry	231,703	231,158	231,120	38	.07
Race/Ethnicity	231,703	231,276	231,123	153	.26
Enlistment Term at Entry	230,799	230,752	230,601	151	.77
High Quality Recruit	231,703	231,353	231,330	23	.06
AFQT Category	231,339	231,085	231,014	71	.22
Number of Dependents at Entry	231,703	231,573	231,470	103	.44
*Marital Status at Entry	231,703	231,590	231,480	110	.49
*CMF Category	231,680	231,658	231,117	541	.96
*MOS Category (CA, CS, CSS)	231,703	231,693	231,174	519	.98
SRS Single Items					
Time Varying					
42. How often smoke before DEP	102,397	101,831	101,787	44	.07
24. Were you ever suspended	82,502	82,315	82,271	44	.19
58. Level of stress/strain	102,422	102,138	101,866	272	.49
23. Were you ever expelled	82,469	82,330	82,312	18	.11
*36. # Serious injuries before Army	102,638	102,583	102,522	61	.53
*01c. Desire to serve my country	101,976	101,928	101,885	43	.47
20. Average grades in high school	101,663	101,591	101,556	35	.33
59. Current level of morale	102,429	102,322	102,122	200	.65
52. Advise male about joining Army	101,967	101,825	101,660	165	.54
22a. Never sent to principal's office	101,078	100,941	100,916	25	.15
35. Average fitness level before Army	102,573	102,297	102,223	74	.21
05. How long in DEP	101,557	101,190	101,151	39	.10
25a. Never thought about quitting HS	100,827	100,167	100,152	15	.02
Fixed					
02d. Wife/Husband/Girlfriend/Boyfriend	97,936	97,816	**97,806**	10	.08
SRS and AIM Composites					
Time Varying					
SRS Thoughts of Quitting High School	100,827	100,243	100,223	20	.03
SRS Trouble in School	101,078	100,664	100,632	32	.07
SRS Attrition Cognitions	102,773	102,188	101,689	499	.46
SRS Reasons for Quitting Previous Jobs	101,992	101,776	101,754	22	.09

Table 3.9. (Continued)

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 *v.* 3	PI (-2LL) Step 3
SRS Reasons for Leaving Army - Probl. Adjusting	102,026	101,772	101,532	240	.49
SRS Reasons for Leaving Army - All Reasons	102,524	102,322	102,172	150	.43
SRS Reasons for Leaving Army - Deviance	101,727	101,637	101,616	21	.19
*SRS Continuance Intentions	102,773	**102,773**	102,599	174	1.00
*SRS Military vs. Civilian - Time for Personal Life	100,986	**100,986**	100,909	77	1.00
*SRS Military vs. Civilian - Overall	102,238	**102,238**	102,130	108	1.00
*SRS Continuance Commitment	102,773	**102,772**	102,635	137	.99
*SRS Reasons for Joining Army - Personal Growth	102,463	**102,462**	102,348	114	1.00
*SRS Participation in High School Activities	102,151	**102,148**	102,118	30	.90
*SRS Military vs. Civilian - Quality of Work Life	102,086	102,079	101,995	84	.93
*SRS Reasons for Joining Army - Travel	102,419	102,387	102,306	81	.72
*SRS Core Army Values - Duty, Integrity, Courage	102,678	102,631	102,543	88	.65
SRS Core Army Values - Loyalty, Selfless Service	102,667	102,577	102,484	93	.51
SRS Participation in DEP Activities	102,045	101,967	101,929	38	.33
SRS Affective Commitment	102,662	102,523	102,307	216	.61
AIM Work Orientation	63,035	62,909	62,883	26	.18
AIM Agreeableness	63,068	62,905	62,867	38	.19
AIM Adjustment	62,987	62,779	62,676	103	.33
SRS Generalized Self Efficacy	102,644	102,192	101,790	402	.47
AIM Dependability	62,935	62,669	62,635	34	.11
AIM Physical Condition	63,032	62,734	62,659	75	.20
Fixed					
SRS Reasons for Joining Army - Escape Problems	102,349	102,279	**102,268**	11	.14

Note. Asterisked predictors were not listed in Table 3.5 because their unadjusted correlations with overall attrition were less than .05 in magnitude. Bolded -2LL values under Step 2 indicate the main effect of the predictor (across time) was not statistically significant. Bolded –2LL values under Step 3 indicate that the effect of the predictor on attrition did not vary significantly over time. *G* Step 2 *v.* 3 = Likelihood ratio test statistic for increment in fit of Step 3 over Step 2. PI (-2LL) Step 3 = Proportion of change in -2LL between Steps 1 and 3 accounted for when the predictor's effect was allowed to vary across time (i.e., the percentage improvement in full model fit when Step 3 was added to the model).

Table 3.9 shows deviance statistics associated with each step of the hierarchal EHA model for each predictor. Recall that in Step 1, the parameterization of time was entered; in Step 2, the predictor itself was entered; and in Step 3, interaction terms between the predictor and the time variables were entered (see Appendix F for details). Also shown in Table 3.8 are likelihood ratio test statistics (*G*) indexing the increment in fit when Step 3 was added to the model (i.e., when the effect of the predictor was allowed to vary across time), and a statistic PI (-2LL) indexing the proportion of improvement in full model fit achieved when Step 3 was added to the model. Predictor variables were designated as having "time varying" effects in the first column of Table 3.9 if the likelihood ratio test of the increment in fit achieved by adding Step 3 was statistically significant.

Table 3.10. c-Statistics by Month of Service for EHA Models of Overall Attrition

Predictor	Weighted M_c	SD_c	*c* Month 1	*c* Month 2	*c* Month 3	*c* Month 4	M_c Months 5-7	M_c Months 8-16	M_c Months 17-37	M_c Months 38-48
Administrative										
Time Varying										
Gender	.548	.026	.635	.573	.531	.534	.549	.555	.528	.555
Education Tier	.536	.018	.542	.533	.524	.529	.532	.535	.543	.513
Pay Grade at Entry	.536	.014	.541	.543	.542	.536	.540	.522	.535	.528
Race/Ethnicity	.535	.021	.558	.547	.541	.549	.539	.519	.530	.536
Enlistment Term at Entry	.517	.024	.536	.514	.533	.524	.526	.530	.501	.512
High Quality Recruit	.532	.021	.511	.531	.541	.527	.527	.526	.537	.531
AFQT Category	.529	.024	.532	.528	.538	.519	.533	.524	.528	.547
Number of Dependents at Entry	.514	.013	.552	.524	.511	.510	.511	.516	.507	.512
Marital Status at Entry	.512	.012	.555	.526	.509	.511	.510	.512	.503	.500
CMF Category	.532	.026	.610	.539	.535	.553	.539	.528	.513	.526
MOS Category (CA, CS, CSS)	.529	.030	.604	.540	.540	.550	.546	.517	.506	.532
SRS Single Items										
Time Varying										
42. How often smoke before DEP	.561	.031	.583	.544	.530	.546	.565	.549	.577	.547
24. Were you ever suspended	.538	.030	.500	.522	.536	.522	.522	.528	.558	.558
58. Level of stress/strain	.553	.041	.696	.616	.568	.565	.556	.531	.515	.509
23. Were you ever expelled	.516	.013	.517	.514	.512	.507	.508	.514	.522	.524
36. # Serious injuries before Army	.516	.021	.574	.529	.532	.506	.511	.510	.504	.505
01c. Desire to serve my country	.518	.033	.586	.527	.503	.508	.515	.516	.511	.541
20. Average grades in high school	.525	.023	.535	.504	.515	.512	.526	.508	.537	.539
59. Current level of morale	.525	.033	.632	.566	.541	.532	.532	.504	.496	.501
52. Advise male about joining Army	.522	.024	.602	.557	.527	.523	.525	.505	.504	.502
22a. Never sent to principal's office	.528	.024	.511	.519	.530	.515	.511	.517	.541	.532
35. Average fitness level before Army	.546	.032	.596	.564	.569	.556	.575	.533	.523	.541
05. How long in DEP	.556	.034	.610	.577	.551	.559	.555	.551	.550	.532
25a. Never thought about quitting HS	.561	.024	.585	.562	.568	.543	.560	.555	.565	.530
Fixed										
02d. Wife/Husband/Girlfriend/Boyfriend	.523	.021	.530	.534	.518	.527	.504	.529	.522	.515

Table 3.10. (Continued)

Predictor	Weighted M_c	SD_c	*c* Month 1	*c* Month 2	*c* Month 3	*c* Month 4	M_c Months 5-7	M_c Months 8-16	M_c Months 17-37	M_c Months 38-48
SRS and AIM Composites										
Time Varying										
SRS Thoughts of Quitting High School	.565	.025	.598	.566	.568	.546	.561	.559	.569	.534
SRS Trouble in School	.553	.030	.548	.540	.552	.539	.521	.538	.571	.563
SRS Attrition Cognitions	.552	.046	.717	.634	.575	.562	.558	.523	.504	.511
SRS Reasons for Quitting Previous Jobs	.541	.023	.588	.546	.537	.536	.514	.535	.540	.538
SRS Reasons for Leaving Army - Probl. Adjusting	.542	.036	.670	.602	.556	.535	.541	.523	.510	.508
SRS Reasons for Leaving Army - All Reasons	.545	.039	.665	.606	.571	.543	.548	.535	.506	.514
SRS Reasons for Leaving Army - Deviance	.520	.018	.561	.535	.524	.515	.520	.516	.511	.508
*SRS Continuance Intentions	.530	.035	.641	.551	.515	.519	.510	.521	.519	.525
*SRS Military vs. Civilian - Time for Personal Life	.523	.030	.569	.536	.529	.511	.501	.514	.518	.546
*SRS Military vs. Civilian Life - Overall	.525	.028	.558	.532	.519	.500	.510	.516	.528	.540
*SRS Continuance Commitment	.522	.034	.587	.549	.505	.490	.502	.506	.518	.538
*SRS Reasons for Joining Army - Personal Growth	.522	.034	.586	.532	.506	.511	.512	.507	.521	.536
*SRS Participation in High School Activities	.514	.026	.543	.505	.529	.526	.534	.501	.507	.503
*SRS Military vs. Civilian - Quality of Work Life	.519	.033	.556	.531	.510	.501	.515	.492	.524	.522
*SRS Reasons for Joining Army - Travel	.519	.033	.584	.541	.518	.511	.529	.506	.503	.522
*SRS Core Army Values - Duty, Integrity, Courage	.515	.041	.575	.531	.507	.515	.538	.486	.509	.509
SRS Core Army Values - Loyalty, Selfless Service	.519	.034	.607	.546	.505	.506	.518	.501	.509	.517
SRS Participation in DEP Activities	.524	.034	.583	.540	.531	.510	.534	.512	.515	.528
SRS Affective Commitment	.530	.038	.651	.588	.524	.529	.526	.508	.504	.506
AIM Work Orientation	.539	.031	.567	.550	.531	.557	.543	.522	.532	.562
AIM Agreeableness	.544	.034	.595	.551	.561	.537	.530	.532	.539	.552
AIM Adjustment	.549	.039	.653	.583	.539	.564	.546	.527	.532	.531
SRS Generalized Self Efficacy	.547	.049	.693	.615	.575	.560	.571	.522	.502	.511
AIM Dependability	.557	.035	.582	.551	.543	.547	.529	.551	.570	.556
AIM Physical Condition	.561	.030	.643	.588	.561	.593	.569	.539	.543	.540
Fixed										
SRS Reasons for Joining Army - Escape Problems	.523	.027	.511	.512	.510	.520	.522	.526	.531	.531

Note. Weighted M_c = Mean *c* across months of service weighted by the number of attritees in each month. SD_c = standard deviation of *c* across the 48 months of service. c-statistics that exceed .550 are highlighted (i.e., the given predictor discriminated between attritees and stayers by at least 10% over chance for the time period). Predictor variables preceded by asterisks had unadjusted correlations with overall attrition in the aggregate data that failed to reach .05 in magnitude.

As Table 3.9 shows, the vast majority of pre-training variables had effects on attrition that significantly varied across the first 48 months of service. However, statistical significance does not speak to the magnitude (nor direction) of the time-varying effect. To assess magnitude of the effect it is useful to review the *G* statistics reported in Table 3.9, as well as the *c*-statistics reported in Table 3.10. In the sections that follow we highlight the strongest time-varying effects for administrative and survey variables.

Time Varying Effects among Administrative Variables

Based on the *G* statistics reported in Table 3.9, the administrative variables with effects that varied most across time were: gender, MOS, and race. The pattern of *c*-statistics for gender across months of service indicates that it discriminated between attritees and stayers best in the first two months of service (1st month $c = .635$, 2nd Month $c = .573$), becoming less predictive in the months that followed. For race, and in particular, the MOS variables, *c*-statistics indicate their effect was strongest early in service, and then dropped off notably beyond seven months of service. Interestingly, by month 8, the majority of Soldiers had already joined their units (q.v., Chapter 2), suggesting that race and MOS may hold stronger relationships with IET attrition (compared to in-unit attrition).

Although *G* and *c*-statistics speak to the magnitude of the time varying effect, they do not indicate the direction of the effect. Table 3.11 provides odds ratios for each of the administrative variables shown in Tables 3.9 and 3.10. Examination of the odds ratios revealed an interesting pattern of findings. For example, during the first and second months of service, the odds of attrition for females were 3.62 and 2.13 times greater (respectively) than the odds of attrition for males. Beyond the first two months of service, the odds of females attriting were never greater than twice the odds for males. With regard to race, the odds of attrition for blacks were significantly less than the odds of attrition for whites through seven months of service, yet beyond that time, the odds of attrition for whites and blacks were far more similar. Lastly, the direction of the relationship between MOS and attrition appeared to fluctuate over time. For example, the odds of attrition for Soldiers in non-combat arms MOS were roughly 3.5 times greater than the odds of attrition for Soldiers in combat arms MOS *in the first month of service*. However, by the second month of service, Soldiers in non-combat arms MOS were only slightly more likely to attrit than Soldiers in combat arms MOS. For months 3 through 7, Soldiers in non-combat arms MOS were actually *less* likely to attrit than Soldiers in combat arms MOS. Beyond that, differences in attrition rates among MOS categories became less substantial. Based on these results, it is not surprising that there was much improvement in fit achieved in the MOS models when their effects were allowed to vary over time.

Time Varying Effects among Survey Variables

Based on the *G* statistics reported in Table 3.9, the survey variables with effects that varied most over time were: SRS Attrition Cognitions, SRS Generalized Self Efficacy, SRS Item 58 (Level of stress/strain), and SRS Item 59 (Level of morale). The *c*-statistics shown in Table 3.10 indicate that the trend in predictiveness for these three variables was quite similar. Specifically, they all discriminated between attritees and stayers extremely well in the first month of service, showed sizable drops in prediction in the months that followed, and were not predictive of attrition beyond seven months of service. This downward trend is also apparent in the odds ratios for these predictors (see Table 3.12).

Table 3.11. Odds Ratios for Administrative Variables by Month of Service for EHA Models of Overall Attrition

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Months 5-7	*OR* Months 8-16	*OR* Months 17-37	*OR* Months 38-48
Gender (Male)	**3.62**	**2.13**	**1.52**	**1.45**	**1.77**	**1.90**	**1.43**	**1.73**
Education Tier (Tier 1)								
Tier 2	**1.80**	**1.68**	**1.46**	**1.47**	**1.73**	**1.74**	**2.02**	**1.41**
Tier 3	**1.99**	0.93	0.65	1.28	1.14	1.12	1.33	0.88
Pay Grade at Entry (E0/E1)								
E2	**0.70**	**0.76**	**0.77**	**0.75**	**0.75**	**0.91**	**0.81**	0.87
E3	**0.62**	**0.66**	**0.63**	**0.63**	**0.74**	**0.79**	**0.68**	**0.66**
E4 or Above	**0.60**	**0.39**	**0.36**	**0.35**	**0.46**	**0.63**	**0.53**	0.73
Race/Ethnicity (White)								
Black	**0.66**	**0.86**	**0.76**	**0.64**	**0.73**	0.92	1.01	**1.23**
Hispanic	**0.48**	**0.53**	**0.61**	**0.59**	**0.76**	**0.78**	**0.63**	0.83
Other	**0.71**	**0.52**	**0.70**	**0.64**	**0.68**	**0.82**	**0.68**	0.84
Enlistment Term at Entry (4 Yr)								
2 Yr	0.76	0.84	0.74	0.84	0.72	**0.43**	**0.59**	
3 Yr	**0.82**	0.96	**1.14**	1.04	**1.22**	0.98	1.00	
5 Yr	0.98	0.94	0.84	0.84	0.92	**1.56**	1.00	0.93
6 Yr	**1.31**	0.98	**0.81**	**0.78**	0.92	**1.26**	0.99	**1.17**
High Quality Recruit (Low Quality)	0.91	**0.79**	**0.73**	**0.73**	**0.82**	**0.81**	**0.74**	**0.79**
AFQT Category (Cat I)								
Cat II	**1.61**	**1.53**	**1.47**	**1.55**	**1.71**	1.23	**1.45**	1.30
Cat IIIa	**1.91**	**1.89**	**1.70**	**1.75**	**2.12**	**1.50**	**1.77**	**1.61**
Cat IIIb	**1.54**	**1.85**	**1.94**	**1.64**	**1.86**	**1.34**	**1.72**	**1.69**
Cat IV	1.22	**1.39**	**2.01**	**1.80**	**2.54**	1.28	**1.33**	1.03
Number of Dependents at Entry (None)								
1	**1.84**	**1.26**	**1.27**	1.19	1.15	**1.26**	**1.15**	1.07
2	**1.86**	**1.45**	1.08	0.99	1.17	**1.17**	**1.11**	**1.28**
3	**2.42**	**1.72**	1.09	1.15	**1.40**	**1.40**	1.09	0.84
4	1.56	0.50	0.69	0.47	1.18	0.81	0.92	0.64
Marital Status at Entry (Single)	**2.15**	**1.52**	**1.18**	1.13	**1.22**	**1.22**	**1.07**	1.02
CMF Category (Administrative)								
Intelligence	1.24	1.07	0.83	**0.44**	0.96	1.04	0.90	0.78
Combat Operations	**0.33**	**0.84**	**1.25**	**1.28**	**1.41**	0.90	**1.13**	0.92
Logistics	0.94	**1.20**	0.97	0.90	1.05	0.99	**1.10**	1.02
Civil & Public Affairs	0.83	1.05	0.98	0.96	0.90	**1.44**	**1.21**	1.03
Communications	**0.76**	1.07	0.88	0.80	0.86	**1.24**	1.04	0.81
MOS Category (Combat Arms)								
Combat Support	**3.47**	1.08	**0.84**	**0.70**	**0.62**	**1.19**	0.95	0.93
Combat Service Support	**3.85**	**1.20**	**0.85**	**0.72**	**0.73**	**1.10**	0.96	1.11
Unknown	**3.58**	**1.51**	**0.50**	**0.21**	0.72	1.13	**0.66**	1.12

Note. Reference groups for each variable are noted in parentheses. Odds ratios less than one indicate the given group was less likely to attrit than the reference group. Odds ratios greater than one indicate the given group was more likely to attrit than the reference group. Odds ratios that were statistically significant ($p < .05$) are bolded.

The finding that SRS Attrition Cognitions had the strongest relationship with attrition in the first month of service is consistent with the civilian turnover literature. Specifically, the best predictor of civilian turnover is often cited as withdrawal cognitions, which reflect intentions to withdraw (Hom & Griffeth, 1995). The fact that Attrition Cognitions' predictiveness—as well as that of other attitudinal variables—drops precipitously across time is also consistent with past work. Specifically, the social psychology literature shows the attitudes that are most predictive of behavior are those that are captured most proximally (in time) to it (Ajzen, 1991; Fishbein & Ajzen, 1975). To illustrate this sizable drop in predictiveness, Figure 3.3 displays *c*-statistics by month of service for SRS Attrition Cognitions.

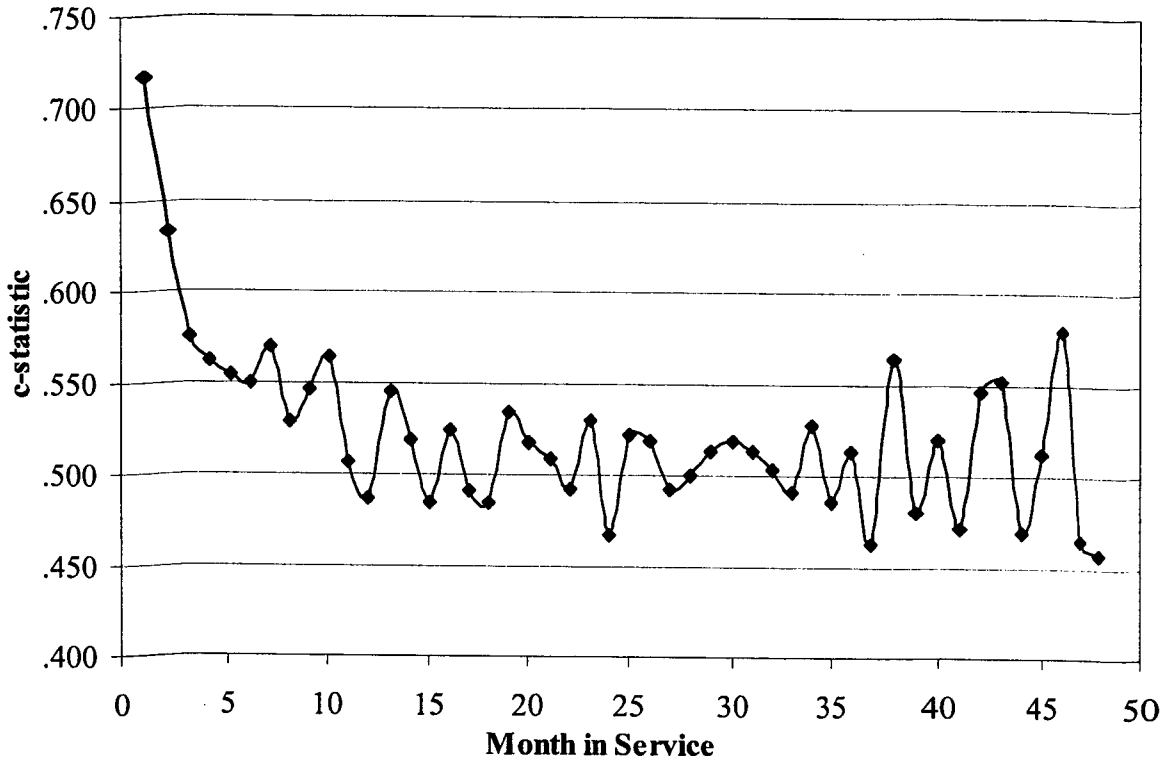


Figure 3.3. Plot of c-Statistics for SRS Attrition Cognitions by Month in Service

Along these same lines, several variables that showed little evidence of prediction in the aggregate sample discriminated well among attritees and stayers in the first month of service (e.g., SRS Continuance Intentions, SRS Continuance Commitment), but did little in the months that followed. Table 3.9 shows that although the main effects for these predictors were not significant, allowing their effects to vary over time provided far better fit to the data.

Table 3.12. Odds Ratios for SRS/AIM Variables by Month of Service for EHA Models of Overall Attrition

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Months 5-7	*OR* Months 8-16	*OR* Months 17-37	*OR* Months 38-48
SRS Single Items								
Time Varying								
42. How often smoke before DEP (Never/Rarely)	**1.96**	**1.35**	**1.41**	**1.48**	**1.65**	**1.49**	**1.88**	**1.44**
24. Were you ever suspended (No)	1.00	**1.19**	**1.34**	1.16	**1.20**	**1.26**	**1.61**	**1.55**
58. Level of stress/strain	**2.28**	**1.40**	**1.38**	**1.33**	**1.25**	**1.12**	**1.05**	1.04
23. Were you ever expelled (No)	**1.64**	**1.51**	**1.52**	1.22	1.25	**1.57**	**1.98**	**2.17**
36. # Serious injuries before Army (None)	**2.21**	**1.37**	**1.50**	1.13	1.17	1.14	1.07	0.96
01c. Desire to serve my country	**0.73**	**0.92**	**0.96**	0.96	0.97	**0.94**	**0.95**	**0.87**
20. Average grades in high school	**0.86**	**0.95**	**0.96**	**0.94**	**0.92**	1.02	**0.87**	**0.88**
59. Current level of morale	**0.58**	**0.78**	**0.82**	**0.84**	**0.86**	0.98	1.00	1.00
52. Advise male about joining Army (Not Army)	**0.28**	**0.47**	**0.59**	**0.61**	**0.68**	0.88	0.91	1.12
22a. Never sent to principal's office (Sent)	0.90	**0.80**	**0.80**	0.87	0.87	**0.86**	**0.67**	**0.69**
35. Average fitness level before Army	**0.69**	**0.77**	**0.78**	**0.77**	**0.76**	**0.88**	**0.92**	**0.86**
05. How long in DEP	**0.67**	**0.76**	**0.83**	**0.81**	**0.83**	**0.84**	**0.84**	0.92
25a. Never thought about quitting HS (Thought)	**0.47**	**0.55**	**0.59**	**0.62**	**0.58**	**0.60**	**0.54**	**0.71**
Fixed								
02d. Wife/Husband/Girlfriend/Boyfriend (No)	**1.33**							
SRS and AIM Composites								
Time Varying								
SRS Thoughts of Quitting High School	**1.39**	**1.21**	**1.24**	**1.20**	**1.20**	**1.23**	**1.27**	**1.19**
SRS Trouble in School	**1.25**	**1.17**	**1.22**	**1.17**	**1.12**	**1.16**	**1.29**	**1.23**
SRS Attrition Cognitions	**2.15**	**1.55**	**1.50**	**1.42**	**1.32**	**1.13**	**1.07**	0.97
SRS Reasons for Quitting Previous Jobs	**1.37**	**1.15**	**1.17**	**1.14**	**1.09**	**1.14**	**1.16**	**1.16**
SRS Reasons for Leaving Army - Problems Adjusting	**1.80**	**1.39**	**1.30**	**1.20**	**1.14**	**1.10**	**1.05**	1.04
SRS Reasons for Leaving Army - All Reasons	**1.52**	**1.30**	**1.26**	**1.18**	**1.14**	**1.12**	1.03	1.05
SRS Reasons for Leaving Army - Deviance	**1.25**	**1.14**	**1.13**	**1.09**	**1.09**	**1.07**	**1.07**	1.05
SRS Continuance Intentions	**0.58**	**0.88**	**0.94**	**0.95**	0.99	**1.08**	**1.08**	1.07
SRS Military vs. Civilian - Time for Personal Life	**0.80**	**0.89**	**0.93**	**0.95**	0.99	**1.06**	**1.07**	**1.14**
SRS Military vs. Civilian Life - Overall	**0.76**	**0.89**	**0.92**	**0.92**	**0.94**	1.04	**1.09**	**1.13**
SRS Continuance Commitment	**0.69**	**0.87**	**0.93**	**0.95**	0.99	1.02	**1.07**	**1.19**

Table 3.12. (Continued)

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Months 5-7	*OR* Months 8-16	*OR* Months 17-37	*OR* Months 38-48
SRS and AIM Composites								
Time Varying								
SRS Reasons for Joining Army - Personal Growth	**0.71**	**0.90**	**0.94**	**0.94**	0.96	1.02	**1.07**	**1.16**
SRS Participation in High School Activities	**0.87**	0.96	0.95	**0.93**	**0.87**	1.01	1.03	1.00
SRS Military vs. Civilian - Quality of Work Life	**0.77**	**0.90**	**0.92**	**0.92**	**0.93**	1.00	**1.06**	1.05
SRS Reasons for Joining Army - Travel	**0.72**	**0.87**	**0.91**	**0.91**	**0.91**	0.96	1.00	**1.09**
SRS Core Army Values - Duty, Integrity, Courage	**0.73**	**0.87**	**0.89**	**0.88**	**0.88**	0.99	1.01	0.98
SRS Core Army Values - Loyalty, Selfless Service	**0.66**	**0.86**	**0.89**	**0.90**	**0.92**	0.95	**0.96**	0.95
SRS Participation in DEP Activities	**0.74**	**0.85**	**0.91**	**0.93**	**0.91**	0.95	**0.95**	**0.89**
SRS Affective Commitment	**0.55**	**0.77**	**0.83**	**0.84**	**0.89**	0.96	0.97	0.99
AIM Work Orientation	**0.78**	**0.82**	**0.82**	**0.87**	**0.86**	**0.91**	**0.89**	**0.82**
AIM Agreeableness	**0.70**	**0.82**	**0.82**	**0.88**	**0.87**	**0.89**	**0.87**	**0.85**
AIM Adjustment	**0.56**	**0.76**	**0.77**	**0.83**	**0.83**	**0.90**	**0.89**	0.92
SRS Generalized Self Efficacy	**0.49**	**0.67**	**0.71**	**0.72**	**0.74**	**0.89**	**0.96**	0.96
AIM Dependability	**0.73**	**0.83**	**0.83**	**0.89**	**0.88**	**0.82**	**0.77**	**0.82**
AIM Physical Condition	**0.60**	**0.72**	**0.73**	**0.79**	**0.77**	**0.86**	**0.86**	**0.88**
Time Varying								
SRS Reasons for Joining Army - Escape Problems	1.09							

Note. For categorical variables, unstandardized odds ratios are reported (reference groups noted in parentheses). For continuous variables, standardized odds ratios are reported. [a] If no odds ratios are listed beyond the first month for a given predictor, effect of the predictor did not significantly vary across time, and the odds ratio presented reflects the main effect for that predictor across all months of service. Statistically significant ($p < .05$) odds ratios are bolded.

Lastly, it is important to note that not all survey variables decreased in their predictiveness over time. Indeed some variables maintained their predictiveness of attrition over time (e.g., SRS Thoughts of Quitting High School, SRS Item 5: How long in DEP), and others actually became slightly more predictive (e.g., SRS Trouble in School, SRS Items 23 and 24: Expelled/Suspended, SRS Item 22a: Never sent to principal's office). The finding that variables assessing pre-service histories of deviance became more predictive over time is not surprising in light of findings presented earlier in this chapter. Recall, such variables were most predictive of Moral Character attrition, and such attrition accounted for the majority of attrition in later time periods. Findings with regard to the staying power of variables reflecting past propensity to quit (or conversely—stay, e.g., months in DEP) are consistent with the long-held axiom that the best predictor of current behavior (e.g., attrition) may be past behavior (e.g., past quitting/staying behavior). This axiom is often cited to help explain the validity of biodata for predicting job performance, as well as first-term attrition (e.g., Owens, 1976; Trent & Laurence, 1993).

DISCUSSION

Summary of Key Findings

Below is a summary of the results associated with the four research questions examined in this chapter.

1. Does the frequency or composition of attrition (e.g., moral character *v.* performance) vary by month in service? If so, how?

The overall attrition rate for the FY99 cohort through 48 months of service was 35%. More than half (51.1%) of all first-term attrition occurred within the first 12 months of service, and nearly one-fifth (18.8%) occurred within the first two months of service alone. Soldiers were at greatest risk for attrition in their second month of service (Hazard = .044), accounting for 12.4% of all attrition. Trends in the distribution of overall attrition across time were consistent with past research (McCloy & DiFazio, 1994). Specifically, Soldiers' risk for attrition spiked in their second month of service, and then decreased steadily until about month 8, after which the hazard stayed relatively constant with a slight bump upward between 17 and 37 months of service.

Analyses of the composition of attrition by month of service revealed several differences. Performance and Medical/Physical attrition accounted for no less than 80% of all attrition through the first six months of service. Most of this attrition could be attributed to ISC 16 (Medically Unqualified for Active Duty, Other) and ISC 87 (Entry Level Performance-Conduct/Trainee Discharge Program). Beyond six months, Moral Character attrition became increasingly prevalent, accounting for roughly 60% of attrition occurring between two and three years of service, and nearly 50% of attrition thereafter. Beyond eight months of service Pregnancy/Parenthood became increasingly prevalent, whereas occurrence of Performance and Medical/Physical attrition diminished substantially.

2. What pre-training variables have the strongest bivariate relationships with attrition?

Using overall attrition through 48 months as a criterion, administrative variables that had the strongest relationships with attrition were gender and education tier. Such findings are consistent with past research that has repeatedly shown these variables to be two of the strongest predictors of first-term attrition (Laurence et al., 1996). Several survey variables predicted overall attrition at levels comparable to or better than gender and education tier. Survey variables reflecting past deviance were found to be predictive of attrition (e.g., SRS Trouble in School, SRS Item 42: Pre-DEP smoking, AIM Dependability). Also performing well were survey variables reflecting past propensities to withdraw (e.g., SRS Thoughts of Quitting School) or conversely stay (e.g., SRS Item 5: How long in DEP). Furthermore, variables reflecting pre-service attitudes and beliefs linked to civilian turnover (e.g., SRS Attrition Cognitions and SRS Generalized Self Efficacy) performed well. Lastly, survey variables reflecting pre-training physical fitness (e.g., AIM Physical Conditioning, SRS Item 35: Average fitness level before Army) performed on par with aforementioned predictors.

3. Do bivariate relationships between pre-training variables and attrition depend on the type of attrition examined? If so, how?

Results revealed that relationships between pre-training variables and attrition depend on the type of attrition examined. Variables reflecting pre-service deviant behavior were most predictive of Moral Character attrition. Variables reflecting pre-service medical limitations were most predictive of Medical/Physical attrition. Variables reflecting pre-service physical fitness were most predictive of Medical/Physical and Performance attrition, suggesting that an important part of performance (at least early on) is physical in nature (e.g., BCT performance). Variables reflecting pre-service attitudes and beliefs (e.g., SRS Generalized Self Efficacy) showed a similar pattern of relationships, being most predictive of Medical/Physical and Performance attrition. Lastly, we found that females were significantly more likely to attrit than males for all types of attrition except Moral Character attrition, for which case they were significantly less likely than males to attrit.

4. Do bivariate relationships between pre-training variables and attrition vary by the month in service when attrition occurs? If so, how?

Results revealed that relationships between the majority of pre-training variables and attrition varied by month of service. However, analyses also revealed that not all of the effects were strong. The strongest time-varying effects among administrative variables were found for gender, race, and MOS. Females were at greatest risk for attrition in the first few months of service, with their risk diminishing in months after that, but becoming heightened again beyond eight months of service. Blacks were initially less likely than whites to attrit, but by the eighth month of service, blacks were about as equally likely to attrit as whites. In the first month of service, combat arms MOS Soldiers were roughly three times *less* likely to attrit than Soldiers in other MOS. Beyond that time, combat arms MOS Soldiers were actually either *more* likely to attrit than Soldiers in other MOS or about equally as likely to attrit. The relationships between attrition and other administrative variables such as education tier, AFQT category and high quality recruit designation remained fairly stable over time.

The strongest time-varying effects among survey variables were for variables that assessed pre-service attitudes and beliefs, in particular SRS Attrition Cognitions, SRS Generalized Self Efficacy, SRS Item 58 (Level of stress/strain), and SRS 59 (Level of morale). These variables were found to be very predictive of attrition in the first month or two of service, but beyond that, showed notable drops in predictiveness, to the point where they failed to discriminate between attritees and stayers beyond seven months of service. The predictiveness of variables reflecting past withdrawal/staying propensity tended to hold up well over time (e.g., SRS Thoughts of Quitting High School, SRS Item 5: How long in DEP). Lastly, variables reflecting pre-service deviant behavior appeared to increase slightly in their predictiveness over time.

Conclusions

The results presented in this chapter provide a fresh look at the composition of first-term attrition. The finding that Medical and Performance attrition dominate attrition through the first six months of Service suggests that future efforts targeted at modeling or reducing early attrition (i.e., IET), should focus on factors identified in this chapter as most salient for predicting such attrition (e.g., pre-training physical fitness, medical limitations, attitudes/beliefs, and past withdrawal propensity). The finding that Moral Character attrition accounts for the majority of attrition in later time periods (beyond 16 months of service), suggests that future efforts targeted at modeling or reducing attrition during this period (i.e., in-unit), should focus on factors identified in this chapter as most salient for predicting such attrition (e.g., past history of deviant behavior).

Also of note, we found that the predictiveness of recruits' attitudes/beliefs about the Army prior to training (which were among the strongest predictors of early attrition) dropped preceipitously across time. This is consistent with social psychology literature, which shows that the attitudes that are most predictive of behavior are those that are captured most proximally (in time) to it (Ajzen, 1991; Fishbein & Ajzen, 1975). Conversely, non-attitudinal variables, particularly those related to pre-service deviant behavior, became more predictive over time. This is consistent with our finding that moral character attrition accounted for the majority of attrition in later time periods. Findings with regard to the staying power of variables reflecting past propensity to quit (or conversely—stay, e.g., months in DEP) are consistent with the long-held axiom from the biodata literature (e.g., Owens, 1976) that one of the best predictors of current behavior (e.g., attrition) is past behavior (e.g., quitting/staying behavior prior to service).

The focus in chapters that follow is on attrition that occurs during four specific time periods: BCT, AIT, OSUT, and in-unit. The results in this chapter have laid the groundwork for understanding what attrition in these critical time periods may look like, as well as what types of variables may best predict attrition within them. We devote a separate chapter to each of these time periods in light of the differences in both the composition of attrition and predictiveness of pre-training variables across months of service. The following chapters serve to expand upon findings in this chapter by developing multivariate models to help the Army predict and understand attrition that occurs during these critical periods. They also incorporate new survey variables that became available upon the completion of each major phase of Soldiers' time in service.

CHAPTER 4: MODELING BASIC COMBAT TRAINING ATTRITION

Dan J. Putka

OVERVIEW

This chapter focuses on predicting and understanding attrition during basic combat training (BCT). As noted in Chapter 2, BCT attrition was defined as attrition that occurred in Soldiers' first two months of service. Although Soldiers accessing into OSUT MOS do not go through the formal nine weeks of BCT that non-OSUT Soldiers do, they were included in the BCT sample to provide a comprehensive look at attrition in the first few months of service.

In light of findings from Chapter 3 that demonstrate a precipitous drop in predictiveness of several SRS variables by even the second month of service (particularly those linked to pre-training attitudes and beliefs), we decided to model attrition occurring in the first and second months of service separately. When interpreting the results presented in this chapter, it is important to remember that the second month attrition criterion was a *conditional* criterion. Specifically, it reflected attrition in the second month of service among Soldiers who completed their first month of service (i.e., first month attritees were excluded).

As in the previous chapter, we modeled BCT attrition using pre-training data only. Furthermore, given that AIM data were only available for a quarter of Soldiers in the cohort, AIM variables were not included in any multivariate models examined in this chapter.[18]

The primary questions we address in this chapter are:

1. How does the composition of attrition across the first two months of service differ?
2. What pre-training variables have the strongest bivariate relationships with BCT attrition?
3. How well can we predict BCT attrition with models that employ multiple pre-training variables?
4. What pre-training variables play the most prominent role in multivariate models of BCT attrition?
5. Can we achieve similar levels of prediction with models that exclude variables that cannot be used in a selection context (e.g., gender, race, MOS)?
6. Are the models of BCT attrition we form better at identifying some types of attritees than others?
7. Can we identify a good-fitting structural model that helps us understand the processes that underlie BCT attrition?

[18] We did examine bivariate relationships between the AIM variables and BCT attrition. We excluded the AIM variables from the multivariate models because their smaller sample sizes would have put an artificial restriction on analysis sample sizes. For example, if AIM variables and SRS variables had been analyzed together in a multivariate analysis, the sample would have been severely curtailed. This restriction occurs due to the listwise deletion procedures commonly used to handle missing data in a multivariate modeling context.

8. To what extent do predictions from theory-driven structural models of attrition overlap with predictions resulting from empirically-driven predictive models of attrition, and further, match their criterion-related validity?

We also explored if and how the relationships between pre-training variables and BCT attrition alluded to in questions 2 through 8 above depended on either (a) the type of attrition examined (e.g., Medical *v.* Performance) or (b) the month of service when attrition occurred.

Answering these questions should help provide the Army with a solid understanding of what factors impact BCT attrition and why, as well as how much promise capitalizing on them might hold for reducing BCT attrition.

METHOD

Sample

The first month sample examined in this chapter included all Soldiers in the research cohort (except those eliminated due to MOS training length issues cited in Chapter 2). As such, the total number of Soldiers in the first month sample was 62,631. At the start of month two, 60,956 of these Soldiers were still in service; thus, they comprised the second month sample. As documented below, not all of these Soldiers had SRS or AIM data; thus, the sample sizes for many of the analyses were smaller than these figures.

Data

As noted above, only data gathered prior to training served as predictor data in this chapter. This included (a) demographic and background information from Army administrative records (e.g., gender, education, enlistment waivers), (b) SRS data gathered at reception battalions, and (c) AIM data for a subset of Soldiers gathered as they processed through their reception battalions. Of the 62,631 Soldiers in the first month sample, 28,471 had SRS data, and 15,746 had AIM data. Of the 60,956 Soldiers in the second month sample, 27,969 had SRS data, and 15,403 had AIM data. Table 4.1 shows the demographic composition of the primary samples of data examined in this chapter relative to the full FY99 cohort.

The criteria we examined were: (a) overall attrition, (b) Medical attrition, and (c) Performance attrition during the first two months of service. Recall from Chapter 2, that we decided when investigating different types of attrition in IET, Medical attrition would be limited to ISC 16, and Performance attrition would be limited to ISC 87, because these two ISCs accounted for the vast majority of attrition during the first several months of service. Imposing this restriction afforded an uncluttered look at factors that were most predictive of them.

Additionally, to help us assess where the multivariate prediction models were performing best and worst, we also analyzed exit survey data that were available for a small subset of Soldiers who attrited during BCT ($n_{\text{Month 1}} = 203$; $n_{\text{Month 2}} = 542$).[19]

[19] A full description of the exit survey data we examined is presented in Chapter 1.

Table 4.1. Demographic Composition of BCT Analysis Samples vs. FY99 Cohort

	FY99 Cohort		Overall Sample: 1st Month		SRS Sample: 1st Month		AIM Sample: 1st Month		Overall Sample: 2nd Month		SRS Sample: 2nd Month		AIM Sample: 2nd Month	
Group	*N*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Gender														
Male	51,107	79.9	50,108	80.0	23,938	84.1	13,748	87.3	49,349	81.0	23,643	84.5	13,524	87.8
Female	12,823	20.1	12,253	19.6	4,533	15.9	1,998	12.7	11,607	19.0	4,326	15.5	1,879	12.2
Race														
White	38,361	60.0	37,329	59.6	17,827	62.6	10,009	63.6	36,339	59.6	17,458	62.4	9,753	63.3
Black	15,325	24.0	15,011	24.0	6,209	21.8	3,329	21.1	14,745	24.2	6,123	21.9	3,272	21.2
Hispanic	6,890	10.8	6,739	10.8	2,963	10.4	1,628	10.3	6,652	10.9	2,933	10.5	1,609	10.4
Other	3,354	5.2	3,282	5.2	1,472	5.2	780	5.0	3,220	5.3	1,455	5.2	769	5.0
AFQT Category														
I	2,306	3.6	1,949	3.1	863	3.0	593	3.8	1,922	3.2	856	3.1	588	3.8
II	18,799	29.4	18,101	28.9	8,390	29.5	4,589	29.1	17,700	29.0	8,247	29.5	4,486	29.1
IIIa	18,247	28.5	18,184	29.0	8,104	28.5	4,608	29.3	17,708	29.1	7,947	28.4	4,484	29.1
IIIb	22,447	35.1	22,054	35.2	10,430	36.6	5,297	33.6	21,587	35.4	10,245	36.6	5,194	33.7
IV-V	2,009	3.1	1,960	3.1	649	2.3	646	4.1	1,927	3.2	639	2.3	638	4.1
Education Tier														
1	55,432	86.7	53,921	86.1	24,800	87.1	12,153	77.2	52,817	86.6	24,423	87.3	11,933	77.5
2	7,966	12.5	7,929	12.7	3,420	12.0	3,465	22.0	7,641	12.5	3,301	11.8	3,345	21.7
3	285	0.4	276	0.4	149	0.5	54	0.3	265	0.4	143	0.5	51	0.3
Totals	63,938		62,631		28,471		15,746		60,956		27,969		15,403	

Note. Because demographic data were missing for a small number of Soldiers, subgroup sample sizes do not always sum to the "totals", and percentages do not always sum to 100%. Also note, actual analysis sample sizes may be smaller than the totals listed here due to missing survey data at the item-level.

Analyses

Composition of BCT Attrition

Given that the composition of attrition during the first two months of service was covered in both Chapters 2 and 3 (see Tables 2.1 and 3.14), we only highlight the results of the previous analyses in this chapter. We repeat the information here to provide a unified look at BCT attrition within the confines of a single chapter.

Bivariate Relationships

As in Chapter 3, we calculated a variety of statistics to assess bivariate relationships between the pre-training variables and each attrition criterion. Specifically, we examined raw correlations, adjusted correlations (Kemery et al., 1988; also see Chapter 3), and *c*-statistics (as well as odds ratios for select administrative variables). For indexing bivariate relationships between administrative variables and BCT attrition, we followed procedures outlined in Chapter 3 (e.g., first generating predicted probabilities of attrition based on each variable, then examining the probabilities' relationships with attrition). Given the large number of variables available, we limited the bivariate analyses to: (a) SRS and AIM composite variables, (b) SRS single items that did not appear in composites, and (c) all administrative variables (see Appendix D for a listing of variables examined).

Multivariate Prediction Models of BCT Attrition

Two of the goals in this chapter were to assess how well models consisting of multiple pre-training variables could predict BCT attrition, as well identifying variables that emerged as the strongest predictors in such multivariate models. To achieve these goals, we developed a multi-step model-fitting algorithm, based heavily on stepwise logistic regression procedures to fit the prediction models. This algorithm is fully described in Appendix G. When initially fitting the models, we included a slightly larger set of variables than those used in the exploration of bivariate relations. Specifically, we identified SRS composites that were particularly heterogeneous (e.g., SRS Reasons for Potentially Leaving the Army- All) and considered the individual items from those composites as potential predictors. Given that the goal of fitting these models was raw prediction; we wanted to give items that contributed to these more heterogeneous composites a chance to enter into the prediction model if they had some predictive variance to offer.

We fitted models for each attrition criterion for the first and second months of service separately. A number of statistics were used to evaluate models' validity and utility for predicting BCT attrition. To assess model validity we reported correlations (raw and adjusted) and *c*-statistics between predicted probabilities resulting from each model, and the given attrition criterion. To evaluate a model's utility for identifying Soldiers who were at particularly greater risk for BCT attrition, we calculated observed attrition rates among the highest scoring 5^{th}, 10^{th}, and 15^{th} percent of respondents on the model's composite (i.e., the predicted probabilities of attrition resulting from the model). We compared these numbers to base rates of attrition for the entire sample (in the given month of service) to assess the extent to which the model might hold utility for identifying recruits at high-risk of BCT attrition.

To assess the relative contribution of each predictor to a model, we examined odds ratios and the decrement in model fit (i.e., change in –2LL) if the given predictor were removed. As in Chapter 3, we report standardized odds ratios for predictors with continuous response scales, and raw odds ratios for categorical predictors. Unfortunately, it is sometimes difficult to use odds ratios to assess the relative contribution of predictors in a model, particularly when dealing with multi-category variables (e.g., AFQT category), which have multiple odds ratios associated with them. In light of this difficulty, we also reported an alternative metric for assessing the performance of predictors against one another, namely the decrement in model fit that resulted if the predictor was removed from the model. Reporting such values has the benefit that only one value is tied to each variable (even for multi-category variables) and it is expressed on the same metric (-2LL) for each predictor.

As a final step in evaluating the multivariate prediction models, we correlated squared deviance residuals resulting from each model with exit survey data for attritees in the samples. Of course, these analyses were conducted only on attritees because they were the only Soldiers in the sample who had exit survey data linked to BCT attrition. A beneficial property of deviance residuals is that when squared, they reflect an individual's contribution to the misfit of a model to the data. Specifically, they reflect a given individual's contribution to the –2LL (i.e., deviance) statistic for the given model (Singer & Willett, 2003). Thus, if you summed all sample members' squared deviance residuals, you would have the –2LL statistic for the model in that sample. Therefore, by examining correlations between squared deviance residuals and exit survey responses from attritees, we can identify the types of attritees for which the models fit best (i.e., responses associated with smaller deviance residuals) and worst (i.e., responses associated with larger deviance residual).

Structural Models of BCT Attrition

The primary goal of building and fitting structural models of BCT attrition was to help the Army understand the mechanisms by which the most salient predictors of early attrition (and their antecedents) function. Unlike the empirically driven prediction models described above, we focused on explanation and understanding, rather than pure prediction. Ideally, the vast majority of predictive variance from the empirical prediction models will be captured in the much smaller set of direct effects on attrition proposed in the structural models.

A secondary goal of this modeling effort was to gain a better understanding of how and where traditionally important demographic variables fall in structural models of BCT attrition. Although variables such as gender and education tier are often cited as good predictors of early attrition (Laurence et al., 1996; Van Iddekinge & Strickland, 2003), past studies have not clarified the paths via which these variables come to influence attrition (e.g., direct or indirect).

In order to build and assess structural models of attrition, we needed a point of departure, specifically, a preliminary structural model around which we could focus our efforts. Given the importance of such a starting model, and the basis it will serve for structuring discussion of our modeling work, we elaborate extensively on it in the sections that follow.

With the exception of the attrition criterion, the structural models examined in this chapter were based only on information that was available prior to Soldiers' entry into BCT (i.e.,

SRS and administrative data). It is important to note that the content, and thereby structure of such models, will change in several ways once a Soldier begins to gain actual experience in the Army. For this reason, in later chapters on AIT and in-unit attrition, we propose different preliminary structural models that account for data that become available once Soldiers gain exposure to the Army environment. However, lack of later data should not be viewed as a major limitation of the structural models presented in this chapter that focus on BCT attrition. Indeed, the only information the Army *could* leverage regarding Soldiers at greatest risk for BCT attrition (and have time to do something about it) *are* those data available prior to training. The models we examine in this chapter will be invaluable for understanding how variables captured prior to training can be used by the Army to help identify those at greatest risk for early attrition.

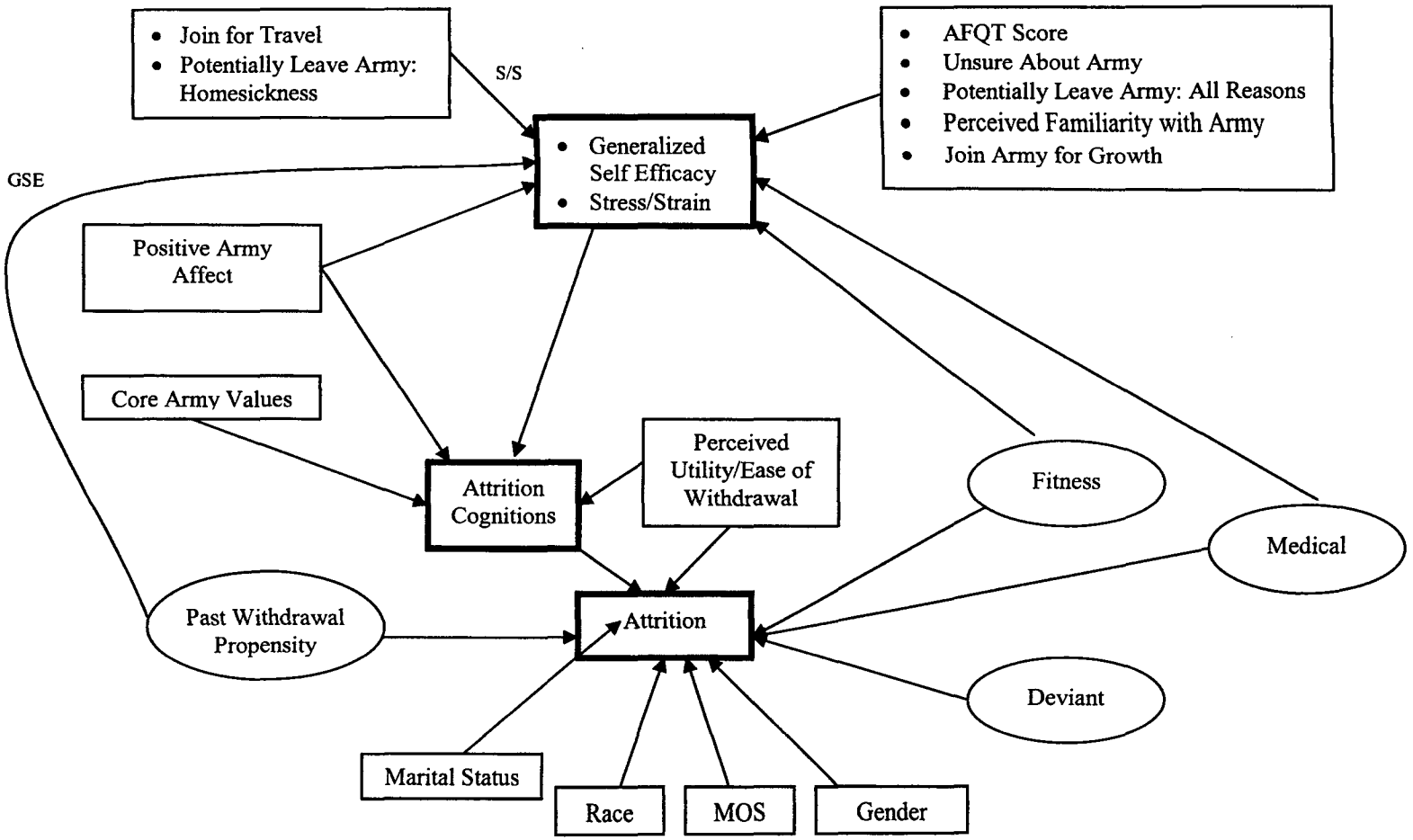
Formulating a Preliminary Structural Model of BCT Attrition

The basis for the preliminary structural model of BCT attrition is grounded in past work from the civilian turnover and industrial-organizational psychology research literatures, past military research on attrition, and theorizing based on results observed over the course of the First Term project. Figure 4.1 presents the preliminary structural model of BCT attrition. We discuss each component of this model below.

Attrition. At the center of this model is the primary criterion, attrition. We will separately model three types of attrition: overall, medical, and performance attrition that occur in the first two months of service. Although we will model different criteria, we have little reason to suspect that the *structure* of these models will differ across criteria. That is we do not believe the ordering of relationships depicted in this model will shift across criteria. What we do expect to differ across criteria is the magnitude of various paths in the model. For example, we hypothesize medical factors would become more salient when modeling medical attrition as opposed to overall attrition, and that such factors may not be predictive at all when modeling performance attrition. Likewise, in light of the findings presented in Chapter 3, we expect that paths linking attitudinal variables to attrition will be stronger in the first month models than in second month models.

Direct Effects on Attrition. To the extent that one can parallel first-term attrition to civilian turnover, reviews of the research literature suggest that withdrawal cognitions or intentions to leave should have the strongest direct effect on attrition (Fishbein & Azjen, 1975; Hom & Griffeth, 1995). This claim is consistent with data presented in Chapter 3 that reveal SRS Attrition Cognitions had the highest c-statistic among any pre-training examined in the first month of service.

Another direct effect on attrition in the preliminary model is perceived utility/ease of withdrawal. Notions of utility and ease of withdrawal (or movement) are apparent in most contemporary models of civilian turnover (e.g., Hom & Griffeth, 1995; Lee & Mitchell, 1994; Steers & Mowday, 1991), having their basis in the seminal work of March and Simon (1958). Often, these variables (i.e., utility and ease) are separated; however, in these data we found little evidence for separation and combined them into one composite (see Appendix H). We hypothesized that this composite variable would have both a direct effect on attrition, and an indirect effect through attrition cognitions. Specifically, we hypothesized that Soldiers who perceive that it is beneficial and easy to leave the Army will experience more attrition cognitions and be at higher risk for attrition.



Note. Variables in bolded boxes were modeled as outcomes (*endogenous* variables). Variables in ovals are component scores resulting from principal components analyses of survey and administrative variables hypothesized to be indicators of Soldiers' standing on the given construct (indicators omitted to simplify depiction of model; see Appendix H). Variables bulleted within the same box lead to the same endogenous variable(s). GSE = Path to Generalized Self Efficacy only. S/S = Path to Stress/Strain only. We hypothesized a path from Generalized Self Efficacy to Stress/Strain was present, but it was omitted from this figure to simplify depiction of the model.

Figure 4.1. Preliminary Structural Model of BCT Attrition (Pre-Training Data Only)

An alternative approach to predicting behavior suggests that one's past behavior should be strongly predictive of current or future behavior. This axiom is often cited to help explain the validity of biodata for predicting job performance and Army attrition (e.g., Owens, 1976; Trent & Laurence, 1993). We hypothesize that one of the most theoretically meaningful predictors of attrition in the Army may be past withdrawal behavior (or conversely past completion behavior). Indeed, it is through this path that education tier's strong relationship with first-term attrition might be explained (i.e., past withdrawal from high school predicts current withdrawal from the Army).

Beyond attrition cognitions, utility/ease of withdrawal, and past withdrawal behavior, there are several pre-training factors that may directly impact BCT attrition that are more specific to the Army context, and likely reflect antecedents of involuntary, rather than voluntary attrition. Specifically, the Army places some very distinct demands on its Soldiers, such as maintaining a reasonable level of physical fitness, ascribing to strict codes for conduct, and functioning under a clear and rigid chain-of-command. As such, factors such as one's pre-training level of physical fitness, medical history, and history of deviant behavior may all be pertinent to identifying Soldiers at risk for attrition. Indeed, the Army currently requires medical enlistment waivers for those with medical limitations, moral character waivers for those with a past history of law violations or illegal drug use, and all MOS have minimum physical requirements that prospective Soldiers are required meet (i.e., PULHES standards). Furthermore, efforts are currently under way to implement pre-service physical fitness entrance tests (Cox, 2004). Taken together, it is clear the Army places a premium on these factors. In light of the lack of past research regarding the paths by which these factors influence attrition, we initially model them as direct effects. Nevertheless, we also hypothesize fitness and medical factors will have an indirect effect on attrition through their impact on generalized self efficacy and stress/strain (discussed below).

It is worth noting that by introducing such factors into the model, we are suggesting a notable departure from civilian models of turnover, the vast majority of which focus exclusively on *voluntary* turnover decisions. Indeed, it is this focus of civilian turnover models on voluntary turnover that also leads them to be less relevant for the modeling of BCT attrition for other reasons as well.[20] Specifically, civilian models are models of turnover among persons who *have* experience in the given organization under study. Since the focus here is on pre-training data only, we are attempting to model future attrition among people who have *no* experience in the Army. Thus, unlike civilian turnover models, a notable characteristic of the model of BCT attrition is the exclusion of variables that reflect attitudes derived from experience in the organization (e.g., job satisfaction, quality of leader member exchange). This fact is clearly seen as one moves beyond the direct effects in the model presented in Figure 4.1.

For example, in the civilian literature, the primary antecedents of withdrawal cognitions or intentions to leave (in our case, attrition cognitions) are job satisfaction and organizational commitment (Hom & Griffeth, 1995). In the case of *pre-training* attrition cognitions, Soldiers have yet to be on the job, and as such have no basis for assessing job satisfaction. Furthermore, determinants of their organizational commitment at this point likely diverge from commonly hypothesized antecedents from the literature that assume on-the-job experience (Mathieu &

[20] A common claim is that attrition is quite different from civilian turnover in that it involves breaking an enlistment contract, whereas civilian turnover does not (Laurence et al., 1996). Additionally, it is also well acknowledged that attrition can be both voluntary and involuntary, whereas civilian models primarily focus on modeling voluntary turnover.

Zajac, 1990). As such, civilian models of turnover are of limited use in formulating pre-training determinants of *pre-training* attrition cognitions.

Indirect Effects. Given the absence of such experience-driven attitudes, we asked ourselves what might underlie pre-training attrition cognitions and other direct effects in the model. We hypothesized that several variables might underlie pre-training attrition cognitions, namely: generalized self efficacy (confidence of Army success), feelings of stress/strain, positive Army affect (i.e., having positive feeling about the Army), embodying core Army values (particularly, as related to a sense of duty, service, and fulfilling obligations), and perceived utility/ease of withdrawal.

In the preliminary model we treated positive Army affect, core Army values, and perceived utility/ease of withdrawal as *exogenous* variables only (i.e., we did not attempt to model their antecedents). Unlike stress/strain and generalized self-efficacy, we were hesitant to attempt to model underlying antecedents of these factors in the pre-training models. This was due to limitations in terms of the types of available data, and our belief that at this point in time (i.e., pre-training) such variables may best be viewed as individual difference variables (e.g., like education tier or gender) that don't lend themselves to treatment as endogenous variables. On the other hand, we hypothesized that many of the available pre-training variables might underlie generalized self efficacy and stress/strain, and as such modeled these two variables as outcomes. In the preliminary model, we hypothesized the following variables would influence Soldiers' pre-training generalized self efficacy and stress/strain:

- *AFQT scores*: Less intelligent, less confident, more stress
- *Fitness*: More fit, more confident, less stress
- *Medical*: Medical problems, less confident, more stress
- *Unsure about the Army*: More unsure, less confident, more stress
- *Past Withdrawal Propensity*: More withdrawal, less confident, more stress
- *Positive Army Affect*: More positive affect, more confident, less stress
- *Perceived Familiarity with Army:* More familiar, more confident, less stress
- *Join Army for Personal Growth*: More confident, more stress
- *Join Army for Travel*: Less stress
- *Potentially Leave Army for Homesickness*: More stress
- *Total Number of Reasons for Potentially Leaving Army*: Less confident, more stress

The last four predictors of generalized self-efficacy and stress/strain are worth further mention because of the way we hypothesized such predictors to function. Specifically, we hypothesized that Soldiers who reported joining the Army for personal growth (e.g., to develop self-discipline, prove that they could do it, become more mature, need to be on their own) would be more confident (otherwise they wouldn't engage in the opportunity for growth), yet at the same time report more stress (realizing the road to personal growth is often difficult). Such a pattern of relationships would be of interest because we hypothesize that low confidence will lead to higher stress, yet we expect personal growth to be positively related to both variables.

With regard to the remaining variables, we hypothesized that those who join the Army for opportunities to travel (also includes adventure) will experience less stress. Conversely, we expect

those who report a potential reason for leaving the Army to be homesickness will be more stressed. We believed both of these variables would function similarly in that they can help identify Soldiers who might not cope well with being away from home (i.e., a potential major source of stress for new Soldiers). Last, we hypothesized that the more reasons Soldiers give for potentially leaving the Army may serve as an indicator of Neuroticism (negative pole of Emotional Stability), and may belie a lack of confidence that they can function effectively in the Army.

Finally, we included four demographic variables that we initially modeled as having direct effects on attrition, namely, marital status, MOS, race, and gender. Past research has revealed consistent relationships between first-term attrition and gender (i.e., women are more likely to attrit than men), whereas findings with regard to marital status and race have been mixed (VanIddekinge & Strickland, 2003). We included MOS based on findings from Chapter 3 that indicated Soldiers in Combat Arms MOS were far less likely to attrit in the first month of service than Soldiers in non-Combat Arms MOS. Admittedly, we have little theoretical basis for proposing these as direct effects in the preliminarily model; nevertheless, our main purpose in including them at this point is to gain an understanding of what role they play (if any) in a structural model of BCT attrition. For example, does gender have a direct effect on attrition, or does the effect of gender disappear once theoretically meaningful variables are accounted for? Including these variables in the model can help the Army better understand the paths through which these variables relate to attrition.

Modeling Strategy

Up to this point in our modeling efforts, we had not made an attempt to aggregate conceptually similar SRS composites, single items, and administrative variables into higher order composites or factors. Several of the variables introduced in the preliminary structural model above were created specifically for this modeling effort (namely, Positive Army Affect, Core Army Values, Perceived Utility/Ease of Withdrawal, Fitness, Medical, Past Withdrawal Propensity, and Deviance). Our goal in creating these higher order variables was to reduce redundancy in the existing set of variables, and facilitate the creation and evaluation of parsimonious structural models of attrition. Appendix H describes the formation of these new variables.

Once all model variables were formed, we proceeded to fit the preliminary model to the data. We used M*plus* analysis software to fit all of the structural models (Muthen & Muthen, 2001). One distinct benefit of this software over other available structural modeling software packages (e.g., LISREL) is that it allows one to assess structural models that have dichotomous outcome variables (e.g., attrition). Prior to fitting the preliminary structural model to the data, we fit an initial exploratory model that included all four Deviance components, as well as both Medical components described in Appendix H. Although we had good reason to believe that all Medical and Deviant components would behave as depicted in the model, our theory was not detailed enough to determine if all of these factors were necessary. As such, in this initial exploratory model we let them all enter as direct effects. We used results of this initial fitting effort to guide us as to whether all or only some of these components should be retained. Once the determination of what Medical and Deviance components to retain was made, we assessed the fit of the preliminary structural model to the data and assessed the significance of its hypothesized paths.

Model fit was assessed by three criteria commonly used in the literature. Namely, we examined the comparative fit index (CFI) and Tucker-Lewis index (TLI) (CFI and TLI values greater than or equal to .95 indicate good fit), as well as the root mean square error of approximation (RMSEA) (values less than or equal to .05 indicate good fit) (Hu & Bentler, 1999). The significance of the paths was based on Wald's statistic (i.e., the path coefficient divided by its standard error), which can be tested against a standard normal distribution (i.e., it can be interpreted as a *z*-statistic).

Because the purpose of the structural modeling effort was mainly to be informative to the Army in its effort to understand attrition, we proceeded to fit additional models to the data eliminating paths that were non-significant in the preliminary model and adding new paths when both (a) simple modification data suggested it, and (b) it was either theoretically meaningful or informative (e.g., as in the case of understanding the role of demographic variables) to do so. We continued this process of refining the preliminary model until we arrived at a final model that (a) fit the data well based on commonly used criteria, (b) consisted of only statistically significant paths, and (c) provided both a theoretically meaningful and informative depiction of the causal structures underlying BCT attrition.

RESULTS

Composition of BCT Attrition

Table 4.2 shows overall attrition figures for the first two months of service. The overall attrition rate in the first month of service was 2.3%; in the second month of service, the conditional rate of attrition was 4.4%. The overall attrition rate for both months of BCT was 6.6%. BCT attrition accounted for about one-fifth (18.8%) of all attrition through 48 months of service. Base rates for Medical attrition were 0.8% in month one ($n_{\text{Attritees}} = 471$), and 1.8% in month two ($n_{\text{Attritees}} = 1{,}090$). Performance attrition rates were 1.0% in month one ($n_{\text{Attritees}} = 652$), and 2.2% in month two ($n_{\text{Attritees}} = 1{,}333$). Performance attrition was more common than Medical attrition in both months of service. In month one, Performance attrition accounted for 46.4% of all attrition that occurred, whereas Medical attrition accounted for 33.5% of attrition. In month two the numbers were a bit more similar, with Performance attrition accounting for 49.4% of all attrition and Medical attrition accounting for 40.4% of all attrition.

Table 4.2. BCT Sample Life Table

Month in Service	Total Entering	In-Service	Attrit	Hazard	Cumulative Attrition Rate	Proportion of All Attrition	Cumulative Proportion of All Attrition
1	62,361	60,957	1,404	.023	.023	.064	.064
2	60,956	58,257	2,699	.044	.066	.124	.188

Note. Total Entering = Number of Soldiers in service at the start of the given month in service. In-Service = Number of Soldiers still in service at the end of the given month in service. Attrit = Number of Soldiers who attrited during the given month in service. Hazard = Proportion of Soldiers who entered the given month in service and attrited during that month (i.e., the conditional attrition rate for the given month). Cumulative Attrition Rate = Proportion of all Soldiers in the sample who attrited during or before the given month in service. Proportion of All Attrition = Proportion of all attritees in the sample who attrited during the given month in service. Cumulative Proportion of All Attrition = Proportion of all attritees in the sample who attrited during or before the given month in service.

Bivariate Relationships between Pre-Training Variables and Attrition

Overall Attrition

First Month of Service

Table 4.3 presents correlations and *c*-statistics for administrative variables, single-item SRS variables, and SRS and AIM composites[21]. Only variables that had correlations of .05 or greater in magnitude with attrition are presented. Based on these results, predictor-attrition relations appear modest based on correlations, but recall that such correlations are heavily attenuated for low base rate criteria, and the base rate in the first month of service is quite low (2.3%). Review of the *c*-statistics (which are invariant to base rate) clearly indicates that several predictors discriminated particularly well between attritees and stayers in the first month of service.

Among administrative variables, both gender and MOS variables fared well, having *c*-statistics exceeding .60 in magnitude. Subsequent review of the odds ratios indicated that odds of attrition for females were 3.63 times greater than the odds for males in the first month of service. Differences in attrition rates among MOS appear to be primarily linked the Combat Arms v. non-Combat Arms MOS distinction. Logistic regression analyses revealed the odds of first month attrition for Soldiers in Combat Support and Combat Service Support MOS were 3.47 and 3.85 times greater (respectively) than the odds of such attrition for Soldiers in Combat Arms MOS. Notably absent from the list of top administrative correlates of first month attrition were education tier and AFQT category.

For attrition in the first month of service, several survey variables achieved levels of prediction that exceeded that of the administrative variables. For example, SRS Attrition Cognitions emerged as the strongest predictor, having a lackluster correlation of .15 (again reflecting the low base rate issue), but an exceptional *c*-statistic of .717. Other survey variables tapping into pre-service attitudes and beliefs also fared very well in predicting first month attrition. For example, both SRS Generalized Self Efficacy and SRS Item 58 (Level of stress/strain) had *c*-statistics over .690. Furthermore, SRS Affective Commitment, SRS Continuance Intentions, and SRS Item 59 (Level of morale), all had *c*-statistics in excess of .630. Also faring well were survey variables that potentially reflect Neuroticism, or conversely Emotional Stability (e.g., SRS Number of Potential Reasons for Leaving- Problems Adjusting, AIM Adjustment). Variables reflecting past withdrawal, core Army values, pre-training fitness, and medical condition were also represented in this list of top correlates of first month attrition. Notably absent were predictors that reflected pre-service deviant behavior.

[21] In this and subsequent tables, refer to the survey booklets in Appendix A for the precise wording of the questions in the various surveys. In each table, we identify the survey and the question/response option number, and provide only a very short extract. The wording of the question stem is often crucial to understanding that extract.

Table 4.3. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Overall Attrition in the First Month of Service

	Overall Attrition			
Predictor	*n*	*r*	*c*	SE_c
Administrative				
Gender	62,361	.10	.635	.008
MOS Category (CA,CS,CSS)	62,361	.06	.604	.007
CMF Category	62,353	.06	.610	.007
Marital Status at Entry	62,361	.05	.555	.008
SRS Single Items				
58. Level of stress/strain	28,386	.09	.696	.013
59. Current level of morale	28,394	-.08	.632	.014
52. Advise male about joining Army	28,272	-.08	.602	.014
47. Work I enjoy most is available	28,360	-.07	.624	.013
37. Medical advice against exercise	28,419	.05	.548	.014
36. # Serious injuries before Army	28,442	.05	.574	.014
35. Average fitness level before Army	28,427	-.05	.596	.013
25a. Never thought about quitting HS	27,907	-.05	.585	.013
05. How long in DEP	28,165	-.05	.610	.013
53. Advise female about joining Army	28,276	-.05	.589	.014
SRS and AIM Composites				
SRS Attrition Cognitions	28,471	.15	.717	.013
SRS Generalized Self Efficacy	28,443	-.13	.693	.013
SRS Reasons for Leaving Army - Problems Adjusting	28,288	.10	.670	.013
SRS Affective Commitment	28,445	-.09	.651	.014
AIM: Adjustment	15,697	-.09	.653	.016
SRS Reasons for Leaving Army - All Reasons	28,408	.08	.665	.012
AIM: Physical Condition	15,715	-.08	.643	.015
SRS Thoughts of Quitting High School	27,907	.07	.598	.014
SRS Core Army Values - Loyalty, Selfless Service	28,435	-.07	.607	.014
AIM: Agreeableness	15,713	-.06	.595	.016
SRS Continuance Intentions	28,471	-.06	.641	.013
SRS Reasons for Quitting Previous Jobs	28,235	.05	.588	.013
SRS Reasons for Joining Army - Travel	28,377	-.05	.584	.014
AIM: Dependability	15,689	-.05	.582	.016
SRS Reasons for Joining Army - Personal Growth	28,389	-.05	.586	.014
SRS Continuance Commitment	28,471	-.05	.587	.015
SRS Core Army Values - Duty, Integrity, Courage	28,438	-.05	.575	.014

Note. r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r and c-statistics are significant ($p < .05$, one-tailed). Within each category, predictors are sorted in descending order by magnitude of their correlation with attrition.

Second Month of Service

Table 4.4 presents correlations and c-statistics for administrative variables, single-item SRS variables, and SRS and AIM composites. Only variables that had correlations of .05 or greater in magnitude with attrition are presented.

Table 4.4. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Overall Attrition in the Second Month of Service

	Overall Attrition			
Predictor	*n*	*r*	*c*	SE_c
Administrative				
Gender	60,956	.08	.573	.006
SRS Single Items				
58. Level of stress/strain	27,886	.08	.616	.009
52. Advise male about joining Army	27,780	-.07	.557	.009
05. How long in DEP	27,670	-.06	.577	.009
25a. Never thought about quitting HS	27,410	-.06	.562	.009
59. Current level of morale	27,894	-.06	.566	.009
35. Average fitness level before Army	27,927	-.05	.564	.009
SRS and AIM Composites				
SRS Attrition Cognitions	27,969	.13	.634	.009
SRS Generalized Self Efficacy	27,943	-.10	.615	.009
SRS Reasons for Leaving Army - Problems Adjusting	27,788	.09	.602	.009
SRS Reasons for Leaving Army - All Reasons	27,906	.07	.606	.009
SRS Affective Commitment	27,944	-.07	.588	.009
AIM: Adjustment	15,356	-.07	.583	.011
AIM: Physical Condition	15,373	-.07	.588	.011
SRS Thoughts of Quitting High School	27,410	.05	.566	.009

Note. r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r_{pb} and c-statistics are significant ($p < .05$, one-tailed). Within each category, predictors are sorted in descending order by magnitude of their correlation with attrition.

The first notable aspect of Table 4.4 is that relative to Table 4.3 there are far fewer predictors listed. This indicates that far fewer variables were as predictive of second month attrition, as they were of first month attrition. Given the attitudinal underpinnings of many of the SRS variables, and the greater temporal distance between the attrition event and the collection of these data, this drop in the validity of many items is not surprising (Fishbein & Ajzen, 1975).[22] Indeed further review of the results in Table 4.4 reveal that while many of the top correlates identified in the first month of service still emerged as the top correlates in the second month sample, their ability to discriminate attritees from stayers was weakened. For example, the *c*-statistics for SRS Attrition Cognitions, SRS Generalized Self Efficacy, and SRS Item 58 (Level of stress/strain) dropped nearly .10 in magnitude. The drops in correlations were not as severe due to the higher rate of attrition observed in the second month of service (4.4%), relative to the first month (2.3%).

[22] Yet another explanation for this phenomenon is range restriction (Hunter & Schmidt, 1990). For example, if a variable was highly predictive of attrition in the first month of service, it is likely that a number of low (or conversely, high, depending on the direction of its relationship with attrition) scorers on that variable left during the first month of service. This would result in a restriction of range on that variable in the second month sample, thereby attenuating its observed correlation with attrition.

Comparison of Bivariate Relationships Across Types of Attrition

Given the differences in base rates across different attrition criteria discussed earlier, we focus subsequent discussion of bivariate relationships on adjusted correlations between predictor variables and criteria. For reference, raw correlations between predictor variables and each type of attrition for both the first and second months of service are presented in Appendix I.

Unlike the findings presented in Chapter 3 regarding attrition through 48 months of service, there were fewer instances where pre-training data was differentially predictive of the different attrition criteria. Table 4.5 shows adjusted correlations between each predictor and each attrition criterion across the first two months of service (Kemery et al., 1988; also see Chapter 3). As the pattern of highlighting shows, within a given month of service, variables that were generally most predictive of Medical attrition were also generally most predictive of Performance attrition (particularly among SRS/AIM composites). Nevertheless, there are several differences in Table 4.5 that are worth noting.

Although gender and MOS variables predicted Medical and Performance attrition about equally as well in the first month of service, by the second month of service they were far more predictive of Performance attrition. Logistic regression analyses revealed that while the odds of second month Medical attrition for females were 1.59 times greater than the odds of such attrition for males, the odds of second month Performance attrition for females were 2.74 times greater than the odds of such attrition for males. Regarding MOS, analyses revealed the odds of second month Performance attrition for Combat Support and Combat Service Support Soldiers were 1.60 and 2.51 times greater (respectively) than the odds of such attrition for Combat Arms Soldiers. Conversely, the odds of second month Medical attrition for Combat Arms and Combat Support Soldiers were not significantly different, and the odds of such attrition for Combat Arms Soldiers were actually 1.25 times greater than the odds of such attrition for Combat Service Support Soldiers.

Among survey variables, SRS Item 37 (Medical advice against exercise) was more related to Medical attrition than Performance attrition in both months of service. Both SRS Core Army Value composites were more related to Performance attrition than Medical attrition. Furthermore, variables reflecting pre-training attitudes and beliefs tended to be slightly more related to Performance attrition (notable exception, SRS Generalized Self Efficacy).

Lastly, it is worth reiterating that perhaps the biggest differences in Table 4.5 were not between different types of attrition, but rather between months of service. As noted above, nearly every predictor experienced a drop in its relationship with attrition from the first to second month of service. Although somewhat expected for attitudinal/belief-related survey variables, this effect was evident among all variables, including the administrative variables.

Table 4.5. Adjusted Correlations between Different Types of BCT Attrition and Top Pre-Training Predictors

	1st Month			2nd Month		
Predictor	Overall	Medical	Perform	Overall	Medical	Perform
Administrative						
Gender	.22	.19	.21	.13	.07	.17
MOS Category (CA,CS,CSS)	.14	.12	.14	.06	.04	.12
CMF Category	.14	.12	.15	.05	.05	.12
Marital Status at Entry	.11	.08	.09	.06	.04	.04
SRS Single Items						
58. Level of stress/strain	.22	.19	.22	.14	.11	.13
52. Advise male about joining Army	-.20	-.14	-.22	-.13	-.07	-.13
59. Current level of morale	-.19	-.15	-.20	-.10	-.09	-.09
47. Work I enjoy most is available	-.16	-.14	-.15	-.07	-.04	-.09
37. Medical advice against exercise	.13	.17	.11	.08	.13	.00
05. How long in DEP	-.13	-.10	-.11	-.10	-.08	-.09
53. Advise female about joining Army	-.13	-.10	-.13	-.07	-.04	-.07
36. # Serious injuries before Army	.12	.14	.10	.05	.09	-.01
35. Average fitness level before Army	-.12	-.12	-.09	-.08	-.07	-.08
25a. Never thought about quitting HS	-.12	-.11	-.11	-.10	-.08	-.10
SRS and AIM Composites						
SRS Attrition Cognitions	.36	.32	.34	.23	.18	.21
SRS Generalized Self Efficacy	-.30	-.30	-.27	-.19	-.17	-.15
SRS Reasons for Leaving Army - Probl. Adjusting	.24	.20	.25	.15	.08	.16
SRS Affective Commitment	-.21	-.17	-.22	-.13	-.08	-.14
AIM: Adjustment	-.21	-.18	-.20	-.12	-.10	-.11
SRS Reasons for Leaving Army - All Reasons	.19	.16	.20	.13	.07	.13
AIM: Physical Condition	-.18	-.15	-.16	-.12	-.10	-.12
SRS Thoughts of Quitting High School	.17	.13	.17	.09	.06	.10
SRS Core Army Values - Loyalty, Selfless Service	-.16	-.09	-.21	-.08	-.01	-.12
SRS Continuance Intentions	-.14	-.10	-.14	-.05	-.04	-.05
SRS Core Army Values - Duty, Integrity, Courage	-.13	-.09	-.16	-.06	-.04	-.08
SRS Reasons for Joining Army - Personal Growth	-.12	-.11	-.12	-.05	-.05	-.03
SRS Continuance Commitment	-.12	-.13	-.10	-.07	-.07	-.06
AIM: Agreeableness	-.12	-.10	-.13	-.07	-.04	-.08
SRS Reasons for Quitting Previous Jobs	.11	.11	.11	.06	.08	.02
SRS Reasons for Joining Army - Travel	-.11	-.09	-.13	-.06	-.05	-.04
AIM: Dependability	-.11	-.07	-.11	-.07	-.05	-.07

Note. Values in cells are adjusted correlations (Kemery et al., 1988) between the given predictor and the given attrition criterion. They provide an estimate of what the correlation would be if the base rate of attrition were .50. Within each category, predictors are sorted in descending order by magnitude of their correlation with overall first month attrition. Correlations are highlighted if their adjusted value was at least .05 in magnitude.

Multivariate Prediction Models

Using the model-fitting algorithm described in Appendix G, we arrived at a predictive model for each attrition criterion in each month of service. For overall attrition, we provided two models: one that did not place any restriction on model content (Final Model A), and one that was limited to only those variables that would not preclude themselves from use in a selection context (namely, gender, MOS, and race; Final Model B). Table 4.6 shows the composition of the final models for each attrition criterion.

Overall Attrition

Top Predictors

Table 4.7 shows odds ratios and change in –2LL statistics for predictors in models of overall attrition. Based on these models, the strongest predictors of BCT attrition were gender, SRS Attrition Cognitions, and SRS Item 5 (How long in DEP). Interestingly, education tier, historically identified as the top predictor of first term attrition, failed to play a large role in models of first month attrition. In the second month of service, education tier was among the stronger contributors to model fit (based on Δ-2LL), yet its effects were small (odds ratios of 1.81 and 1.73 for Tier 2 Soldiers). Another strong contributor to model fit in the second month of service was SRS Reasons for Potentially Leaving the Army- All. For every one standard deviation increase on this predictor, Soldiers were about three times as likely to attrit. Some of the irrelevant variance in this predictor appeared to be suppressed through inclusion of other SRS Reasons for Potentially Leaving composites (e.g., Deviance, Discrimination, Problems Adjusting) in the second month model. Such suppression is evidenced by odds ratios that were less than 1.0 for these other composites, in combination with the positive bivariate relationships they had with attrition.

Model Validity/Utility

Table 4.8 shows validity and utility statistics for the final predictive models of overall attrition.[23] Also shown in Table 4.8 are statistics for three reference models to help judge the validity and utility of our models against meaningful references. Specifically, we fit a reference model consisting of administrative variables only; another consisting only of the best predictor of attrition in the sample (i.e., SRS Attrition Cognitions); and one consisting of SRS Attrition Cognitions and administrative variables only.

[23] Note, utility statistics are not reported for two of the reference models (Admin Only and BestPred Only) because they did not result in enough unique predicted probabilities for Soldiers to generate percentile information. The reason this occurred is that the model was either composed of a limited number of categorical variables, for which 20 unique combinations were not present in the sample (Admin Only); or that there were fewer than 20 unique values of the predictor in the sample (BestPred Only).

Table 4.6. Variables in Final Multivariate Prediction Models of BCT Attrition

Predictors	Overall Attrition		Medical Attrition		Performance Attrition	
	1st Mo	2nd Mo	1st Mo	2nd Mo	1st Mo	2nd Mo
Administrative						
AFQT Category at Entry				X		
Career Management Field Category						X
Education Tier at Entry	B	A,B	X	X		X
Enlistment Term at Entry	B					
Marital Status at Entry	B	A,B		X		
Medical Failure: Other	A,B					
Medical Failure: Physical Extremities		A,B		X		
MOS Classification (CA, CS, CSS)	A		X	X		
Pay Grade at Entry						
Physical Enlistment Waiver			X			
Race/Ethnicity		A		X		X
Gender	A	A	X	X	X	X
Youth Program Participation		A,B		X		
SRS Single Items						
01a. Army advertising		A,B				
01c. Desire to serve my country	A	A		X		
01u. Make Army a career		A,B				X
02d. Wife/Husband/Girlfriend/Boyfriend						X
02f. Teacher	A					
02n. Printed advertisement		A,B		X		
04. Expected of you in the Army	A,B					
05. How long in DEP	A,B	A,B	X	X	X	X
20. Average grades in high school					X	
21. College when enlistment term is up		A				X
25b. Family need				X		
25c. Expelled or suspended			X			
25g. Didn't get along with students			X			
25k. Wanted to work full time					X	
26a. Participated in Athletic teams				X		
26b. Participated in Drama, music, art		B				
36. # Serious injuries before Army	A,B			X		
37. Medical advice against exercise		A,B	X	X		
38e. Left job-fired					X	
40. Medical waiver needed to join Army				X		
42. How often smoke before DEP	A,B		X			
43. How often drink alcohol before DEP			X			
57c. Family problems at home		A,B		X	X	
57d. Pregnancy				X	X	
57f. Poor academic performance		A,B		X		X
57g. Illness/medical condition	A,B		X			
57m. Better job outside the Army		A,B		X		

Table 4.6. (Continued)

Predictors	Overall Attrition 1st Mo	Overall Attrition 2nd Mo	Medical Attrition 1st Mo	Medical Attrition 2nd Mo	Performance Attrition 1st Mo	Performance Attrition 2nd Mo
SRS Single Items						
57n. Injuries during training		A,B		X		
57o. Not getting desired military job		A,B		X		
58r. Level of stress/strain	A,B	B	X.		X	
59. Current level of morale	A				X	
SRS Composites						
Attrition Cognitions	A,B	A,B	X	X	X	X
Continuance Commitment			X			
Continuance Intentions	B					
Core Army Values - Loyalty, Selfless Service			X		X	X
Generalized Self Efficacy	B		X			
Military vs. Civilian - Quality of Work Life		B				
Military vs. Civilian - Time for Personal Life	B		X			X
Participation in High School Activities				X		
Reasons for Joining Army - Escape Problems				X		
Reasons for Joining Army - Job Benefits	A,B					X
Reasons for Joining Army - Travel	A					
Reasons for Leaving Army - All Reasons		A,B		X		X
Reasons for Leaving Army - Deviance	A,B	A,B		X	X	
Reasons for Leaving Army - Discrimination		A,B		X		
Reasons for Leaving Army - Probl. Adjusting	B	A,B		X		
Reasons for Quitting Previous Jobs				X		
Thoughts of Quitting High School	A,B					
Unsure about Army Career		A,B		X		

Note. A = Predictor is part of Final Model A (no restrictions on model content) for the given month of service. B = Predictor is part of Final Model B (model excludes, gender, race, and MOS) for the given month of service. X = Predictor is part of the final model for the given type of attrition/month of service.

Examination of Table 4.8 reveals several noteworthy findings. First, note that all of the final models for both months of service provided excellent levels of discrimination between attritees and stayers. This was particularly true in the first month of service where *c*-statistics exceeded .80 in magnitude. Such values indicate that these models were discriminating between attritees and stayers at levels that were beyond 60% greater than chance. Within both months of service, the validities of the "A" models were not substantially greater than the validities of the "B" models; indicating that exclusion of factors such as gender, race and MOS from Final Model B did not significantly harm its ability to predict attrition. Comparing models across months of service revealed that the first month models had notably higher levels of validity than the second month models. This is consistent with the pattern of findings presented earlier demonstrating the decrement in the magnitude of bivariate relationships between predictors and attrition across months of service.

Table 4.7. Odds Ratios for Variables in Final Multivariate Prediction Models of Overall Attrition

	1st Month				2nd Month			
	Model A		Model B		Model A		Model B	
Predictor	*OR*	Δ -2LL	*OR*	Δ -2LL	*OR*	Δ -2LL	*OR*	Δ -2LL
Administrative								
Education Tier at Entry (Tier 1)				14.0		41.8		34.0
Tier 2			1.58		1.81		1.73	
Tier 3			3.14		**1.11**		**0.88**	
Enlistment Term at Entry (4 Yr)				16.3				
2 Yr			**1.30**					
3 Yr			0.78					
5 Yr			1.37					
6 Yr			1.44					
Marital Status at Entry (Single)			1.78	17.9	1.38	11.2	1.46	14.7
Medical Failure. Physical Extremities (No)					1.64	6.9	1.48	4.0
Medical Failure. Other (No)	1.91	12.8	1.90	12.5				
MOS Classification (Combat Arms)		37.1						
Combat Support	2.43							
Combat Service Support	2.19							
Unknown	**1.49**							
Race/Ethnicity (White)						33.9		
Black					0.82			
Hispanic					0.59			
Other					0.46			
Gender (Male)	3.27	112.0			2.57	138.1		
Youth Program Participation (None)						9.3		9.8
JROTC/ROTC- Army					**0.76**		**0.70**	
JROTC/ROTC- Other Service					1.74		1.71	
Other Program					**1.88**		**1.93**	
SRS Single Items								
01a. Army advertising					1.09	5.8	1.08	4.6
01c. Desire to serve my country	1.13	5.4			1.08	4.2		
01u. Make Army a career					1.09	5.3	1.14	11.0
02f. Teacher (No)	0.64	4.7						
02n. Printed advertisement (No)					0.73	5.4	0.75	4.4
04. Expected of you in the Army	1.16	9.5	1.18	11.7				
05. How long in DEP	0.65	75.4	0.66	58.8	0.78	51.5	0.76	60.0
21. College after enlistment (Undecided)						8.2		
No					**1.14**			
Yes					0.84			
26b. Participated in Drama, music, art							1.13	12.8
36. # Serious injuries before Army	1.20	15.6	1.16	10.4				
37. Medical advice against exercise (No)					1.51	12.1	1.39	7.1
42. How often smoke before DEP	1.19	11.7	1.13	5.6				
57c. Family problems at home (No)					0.77	8.8	0.70	14.9

Table 4.7. (Continued)

	1st Month				2nd Month			
	Model A		Model B		Model A		Model B	
Predictor	*OR*	Δ -2LL	*OR*	Δ -2LL	*OR*	Δ -2LL	*OR*	Δ -2LL
SRS Single Items								
57f. Poor academic performance (No)					0.51	24.6	0.49	27.2
57g. Illness/medical condition (No)	1.58	16.6	1.61	17.8				
57m. Better job outside the Army (No)					0.68	15.4	0.59	28.4
57n. Injuries during training (No)					0.64	19.6	0.60	23.7
57o. Not getting desired military job (No)					0.67	19.7	0.62	26.2
58. Level of stress/strain	1.22	9.0	1.33	18.4			1.12	7.3
59. Current level of morale	0.89	5.7						
SRS Composites								
Attrition Cognitions	1.85	143.5	1.64	55.6	1.58	157.4	1.62	146.6
Continuance Intentions			0.85	6.0				
Generalized Self Efficacy			0.83	9.7				
Military vs. Civilian - Quality of Work Life							1.09	5.0
Military vs. Civilian - Time for Personal Life			1.25	15.0				
Reasons for Joining Army - Job Benefits	1.14	6.6	1.13	6.0				
Reasons for Joining Army - Travel	0.90	4.1						
Reasons for Leaving Army - All Reasons					2.76	53.6	3.16	64.7
Reasons for Leaving Army - Deviance	0.91	5.0	0.91	5.2	0.74	30.5	0.71	38.2
Reasons for Leaving Army - Discrimination					0.78	26.4	0.78	26.3
Reasons for Leaving Army - Probl. Adjusting			1.13	4.6	0.82	11.0	0.78	15.8
Thoughts of Quitting High School	1.21	25.4	1.12	7.8				
Unsure about Army Career					0.92	6.4	0.89	12.2

Note. For categorical variables unstandardized odds ratios are reported (reference groups are noted in parentheses). For continuous variables, standardized odds ratios are reported. Δ - 2LL = Change in -2LL when the given predictor is removed from the model. Variables that have no odds ratios for a given model were not part of that model. All odds ratios are significant ($p < .05$) except those that are bolded.

Results regarding the utility of these models were also quite strong. For example, although the base rate of first month attrition in the model sample was only 1.8%, the attrition rate among Soldiers who scored in the top 5% of the Model A composite (i.e., the predicted probabilities) was 15.0%. Thus, Soldiers scoring in this top 5% were 8.3 times more likely to attrit than the average Soldier in the first month of service. Similarly strong utility figures emerged for Model B in the first month of service as well. Results regarding the utility of the second month models were also strong. For example, whereas the base rate of second month attrition in the model sample was 4.1%, the attrition rate among Soldiers who scored in the top 5% of the Model A composite was 19.1%. Thus, Soldiers scoring in this top 5% were 4.7 times more likely to attrit than the average Soldier in the second month of service. Such findings indicate that these models may hold great utility for identifying Soldiers at heightened risk for BCT attrition.

Table 4.8. Validity and Utility Statistics for Final Multivariate Models of Overall Attrition

			Model Validity					Model Utility			
				95% C.I. *c*							
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*	Attrit Rate Top 5%	Attrit Rate Top 10%	Attrit Rate Top 15%	Base Rate
1st Month											
Final Model A	19	17	.830	.810	.850	.31	.74	.150	.099	.077	.018
Admin Only	19	9	.758	.735	.780	.14	.35				
BestPred Only	1	1	.721	.694	.749	.20	.49				
BestPred + Admin	16	9	.817	.796	.839	.29	.70	.142	.093	.074	.018
Final Model B	22	18	.812	.791	.834	.26	.64	.135	.090	.068	.017
Admin Only	15	8	.745	.722	.768	.13	.32				
BestPred Only	1	1	.722	.694	.749	.20	.48				
BestPred + Admin	12	7	.810	.788	.832	.27	.67	.135	.083	.066	.017
2nd Month											
Final Model A	30	24	.741	.725	.757	.23	.41	.191	.144	.122	.041
Admin Only	18	8	.658	.641	.676	.13	.24				
BestPred Only	1	1	.635	.616	.655	.15	.27				
BestPred + Admin	28	11	.722	.706	.739	.21	.37	.180	.136	.119	.041
Final Model B	26	23	.724	.707	.741	.21	.37	.180	.139	.113	.041
Admin Only	27	10	.663	.645	.682	.14	.25				
BestPred Only	1	1	.634	.614	.655	.15	.27				
BestPred + Admin	28	11	.724	.707	.741	.21	.38	.181	.135	.117	.041

Note. df = Model degrees of freedom (i.e., number of parameters estimated). *k* = Number of model variables. *c* = c-statistic indexing the relationship between probabilities resulting from the given model and attrition criterion. 95% C.I. *c* = 95% confidence interval of *c*-statistic. Lower = lower bound of CI. Upper = upper bound of CI. r_{pb} = Point-biserial correlation. r_{pb}* = Adjusted point-biserial correlation. Attrit Rate Top 5% = Attrition rate among Soldiers scoring in the top 5% of the given model composite (i.e., the predicted probabilities of attrition resulting from the model). Attrit Rate Top 10% = Attrition rate among Soldiers scoring in the top 10% of the given model composite. Attrit Rate Top 15% = Attrition rate among Soldiers scoring in the top 15% of the given model composite. Base rate = Attrition rate in sample on which model is based. Admin Only = Model consisting of administrative variables only. BestPred Only = Model consisting of SRS Attrition Cognitions only. BestPred + Admin = Model consisting of SRS Attrition Cognitions and administrative variables only. All *c* and r_{pb} statistics are significant ($p < .05$).

Although the validity and utility numbers for the final models were strong, these findings are somewhat tempered by their performance in relation to the reference models shown in Table 4.8. For example, although the final models out-performed the Admin Only and BestPred Only models in all samples, they did not perform notably better than a model consisting of only SRS Attrition Cognitions and administrative variables.

Deviance Residual Analysis

To determine if the models were better at identifying some types of attritees than others, we examined correlations between the models' deviance residuals and Soldiers' exit survey responses. Results of these analyses are shown in Table 4.9. Across all models, we consistently found significant positive relationships between attritees' residuals and their level of satisfaction with various aspects of the entry process, as well as training itself. Such correlations suggest that the models fit better for attritees who were less satisfied with training and the entry process. Examining relationships between attritees' residuals and their self-reported reasons for leaving revealed few consistent findings, though it appears that the first month models fit better for attritees who reported leaving for physical or medical reasons. Last, we examined relationships between attritees' residuals and the degree to which they indicated various types of interventions would have helped them complete their enlistment term. Nearly regardless of the type of intervention, it appeared the first month models fit better for attritees who strongly felt interventions would have helped. Although a similar pattern of findings was apparent in the second month of service, correlations were smaller in magnitude.

As a follow-up to the analysis with exit survey variables, we also examined the correlation between deviance residuals based on predictions from the first month model and Soldiers' day of attrition from BCT. Analyses revealed a significant positive correlation ($r = .34$, $N = 1{,}493$) between these variables, indicating that the overall model fit better for attritees who attrited earlier in BCT. This finding was quite consistent with the smaller bivariate relationships and model validities we found in the second month of service.

Medical vs. Performance Attrition

Top Model Predictors

Tables 4.10 and 4.11 show odds ratios and change in –2LL statistics for predictors in models of Medical and Performance attrition (respectively). Based on these models, the strongest predictors of Medical attrition appeared to vary slightly by month of service. In the first month of service, the strongest predictors of Medical attrition were: gender, SRS Item 5 (How long in DEP), SRS Attrition Cognitions, and SRS Item 57g (Potentially leave Army for illness/medical condition). In the second month of service, the strongest predictors of Medical attrition were: SRS Reasons for Potentially Leaving the Army- All, SRS Attrition Cognitions, SRS Item 5 (How long in DEP), and gender. Like the models of overall attrition examined earlier, several of the variables in the second month model that pertained to potential reasons for leaving the Army (e.g., SRS Item 57 and associated composites) appeared to suppress irrelevant variance in SRS Reasons for Potentially Leaving the Army- All.

For Performance attrition, gender was the strongest predictor in both months of service. Specifically, females were three to four times more likely to attrit for performance reasons than males, even after controlling for all other model variables. Beyond that, SRS Attrition Cognitions emerged as a strong predictor for both samples, and SRS Item 5 (How long in DEP) emerged as a strong predictor in the first month sample.

Table 4.9. Correlations between Overall Attrition Model Deviance Residuals and Exit Survey Responses

	1st Month				2nd Month			
	Model A		Model B		Model A		Model B	
Exit Survey Item/Composite	*n*	*r*	*n*	*r*	*n*	*r*	*n*	*r*
02. How Army compared with expectations	237	.10	235	.06	581	**.08**	533	**.11**
04. Health now vs. Army entry	241	**.13**	239	.00	581	**.13**	535	.05
07. Feelings about leaving Army	245	-.06	243	-.06	591	**-.07**	542	**-.08**
11. Advice to male about Army	240	-.04	239	.00	581	**.12**	533	**.17**
12. Advice to female about Army	240	.06	239	.07	576	**.16**	529	**.18**
Satisfaction								
03a. Satisfied-Recruiter	245	**.12**	243	.10	584	.06	538	**.08**
03b. Satisfied-Delayed Entry Program	231	**.13**	229	**.19**	558	**.09**	514	**.11**
03c. Satisfied-MEPS	245	**.11**	243	**.14**	587	**.14**	537	**.19**
03d. Satisfied-Reception Station	246	**.20**	244	**.14**	588	**.13**	540	**.13**
08. Satisfied with training received	244	**.17**	242	**.11**	590	**.07**	540	**.10**
Reasons for Leaving								
Reasons for Leaving Army - Deviance	247	**.13**	245	.09	595	.01	546	-.02
Reasons for Leaving Army - Probl.w/ Supervision	247	.06	245	.01	596	-.05	547	-.06
Reasons for Leaving Army - Problems Adjusting	247	-.05	245	**-.12**	596	**-.11**	547	**-.09**
Reasons for Leaving Army - Discrimination	247	.01	245	.01	595	-.07	546	-.05
Reasons for Leaving Army - Phys/Med Problems	247	**-.22**	245	-.17	597	-.05	548	-.03
Helped to Complete your Term								
06a. Accurate PS medical information	246	**-.21**	244	**-.17**	592	.05	542	.05
06b. Improve counseling for adjusting	247	**-.15**	245	**-.14**	592	**-.09**	543	**-.09**
06c. Realistic preview of Army life	246	**-.17**	244	**-.12**	592	**-.08**	543	-.06
06d. Rigorous physical training prior	246	**-.21**	244	**-.11**	592	**-.09**	543	-.05
06e. Inform family on support	247	**-.12**	245	**-.12**	590	**-.13**	541	**-.11**
06f. Maintain fair standards	246	-.09	245	-.06	592	**-.09**	544	**-.07**
06g. Collect confidential feedback	245	-.07	244	-.06	593	-.06	544	-.05
06h. More respect for recruits	246	**-.21**	244	**-.16**	591	**-.12**	543	**-.12**
06i. Incentives for good performance	246	**-.19**	244	**-.15**	593	**-.09**	544	**-.08**
06j. Value of Army benefits	247	**-.16**	245	**-.12**	593	-.04	544	-.01

Note. Correlations were calculated for those attritees who had exit survey data. Deviance residuals were squared prior to correlating with exit survey responses. Bolded correlations are statistically significant ($p < .05$, one-tailed).

Model Validity/Utility

Table 4.12 shows validity and utility statistics for the final models of Medical and Performance attrition. Also shown in Table 4.12 are statistics for three reference models to help judge the validity and utility of our models against meaningful references (described earlier).

Table 4.10. Odds Ratios for Variables in Final Multivariate Models of Medical Attrition

	1st Month		2nd Month	
Predictor	*OR*	Δ -2LL	*OR*	Δ -2LL
Administrative				
AFQT Category at Entry (Cat I)				13.3
Cat II			**1.59**	
Cat IIIa			2.28	
Cat IIIb			2.20	
Cat IV			**2.36**	
Education Tier at Entry (Tier 1)		11.5		19.7
Tier 2	2.01		1.73	
Tier 3	**1.01**		**0.00**	
Marital Status at Entry (Single)			1.37	4.8
Medical Failure: Physical Extremities (No)			1.97	8.0
Medical/Physical Enlistment Waiver (No)	2.10	7.2		
MOS Classification (Combat Arms)		12.4		25.8
Combat Support	2.27		**0.85**	
Combat Service Support	1.80		0.54	
Unknown	**1.48**		**0.41**	
Race/Ethnicity (White)				9.9
Black			**0.79**	
Hispanic			0.64	
Other			**0.58**	
Gender (Male)	3.12	43.2	2.11	29.1
Youth Program Participation (None)				13.2
JROTC/ROTC- Army			**0.61**	
JROTC/ROTC- Other Service			2.07	
Other Program			6.07	
SRS Single Items				
01c. Desire to serve my country			1.19	10.1
02n. Printed advertisement (No)			0.62	5.2
05. How long in DEP	0.70	18.9	0.74	31.0
25b. Family need (No)			0.54	5.2
25c. Expelled or suspended (No)	0.39	5.5		
25g. Didn't get along with students (No)	1.96	5.8		
26a. Participated in Athletic teams			0.85	6.6
36. # Serious injuries before Army			1.11	4.8
37. Medical advice against exercise (No)	1.92	8.1	1.74	10.8
40. Medical waiver needed to join Army (No)			1.50	7.3
42. How often smoke before DEP	1.21	5.1		
43. How often drink alcohol before DEP	1.25	8.0		
57c. Family problems at home (No)			0.69	4.9
57d. Pregnancy (No)			0.42	21.6
57f. Poor academic performance (No)			0.35	26.7
57g. Illness/medical condition (No)	1.97	16.0		
57m. Better job outside the Army (No)			0.51	21.7

Table 4.10. (Continued)

Predictor	1st Month		2nd Month	
	OR	Δ -2LL	*OR*	Δ -2LL
SRS Single Items				
57n. Injuries during training (No)			0.41	31.0
57o. Not getting desired military job (No)			0.39	47.1
58. Level of stress/strain	1.33	7.8		
SRS Composites				
Attrition Cognitions	1.53	16.6	1.48	52.6
Continuance Commitment	0.81	6.4		
Core Army Values- Loyalty, Selfless Service	1.34	12.3		
Generalized Self Efficacy	0.73	11.5		
Military vs. Civilian- Time for Personal Life	1.26	7.1		
Participation in High School Activities			1.24	12.9
Reasons for Joining Army - Escape Problems			0.87	6.6
Reasons for Leaving Army - All Reasons			7.19	74.7
Reasons for Leaving Army - Deviance			0.53	56.8
Reasons for Leaving Army - Discrimination			0.61	43.7
Reasons for Leaving Army - Problems Adjusting			0.56	36.7
Reasons for Quitting Previous Jobs			1.16	9.7
Unsure about Army Career			0.87	6.9

Note. For categorical variables unstandardized odds ratios are reported (reference groups are noted in parentheses). For continuous variables, standardized odds ratios are reported. Δ - 2LL = Change in -2LL when the given predictor is removed from the model. Variables that have no odds ratios for a given model were not part of that model. All odds ratios are significant ($p < .05$) except those that are bolded.

Like the models of overall attrition presented earlier, all of the final models of Medical and Performance attrition provided excellent levels of discrimination between attritees and stayers. This was particularly true in the first month of service, where *c*-statistics exceeded .80 in magnitude. Once again, comparison of models across months of service revealed that the first month models had higher levels of validity than the second month models.

Results regarding the utility of these models were also quite strong. For example, although the base rate of first month Medical attrition in the model sample was only 0.7%, the attrition rate among Soldiers who scored in the top 5% of the final Medical "A" model composite was 7.1%. Thus, Soldiers scoring in this top 5% were 10.1 times more likely to attrit for medical reasons than the average Soldier in the first month of service. Similarly impressive utility figures emerged for the final Performance model in the first month of service as well as for models of second month attrition.

Table 4.11. Odds Ratios for Variables in Final Multivariate Models of Performance Attrition

	1st Month		2nd Month	
Predictor	*OR*	Δ -2LL	*OR*	Δ -2LL
Administrative				
Career Management Field Category (Admin)				16.5
Intelligence			**1.40**	
Combat Ops			**0.86**	
Logistics			**1.09**	
Civil & Public Affairs			0.34	
Communications			**1.02**	
Education Tier at Entry (Tier 1)				27.5
Tier 2			1.95	
Tier 3			**2.18**	
Race/Ethnicity (White)				24.6
Black			**0.86**	
Hispanic			0.50	
Other			0.37	
Gender (Male)	4.27	76.8	3.11	99.0
Single Items				
01u. Make Army a career			1.20	10.1
02d. Wife/Husband/Girlfriend/Boyfriend (No)			1.29	5.0
05. How long in DEP	0.64	36.0	0.81	16.9
20. Average grades in high school	0.80	9.0		
21. College after enlistment (Undecided)				9.9
No			**1.12**	
Yes			0.73	
25k. Wanted to work full time (No)	2.14	12.0		
38e. Left job-fired (No)	1.59	6.0		
57c. Family problems at home (No)	1.90	17.2		
57d. Pregnancy (No)	1.57	4.8		
57f. Poor academic performance (No)			0.61	7.3
58. Level of stress/strain	1.39	10.3		
59. Current level of morale	0.79	9.5		
SRS Composites				
Attrition Cognitions	1.51	26.7	1.64	94.1
Core Army Values- Loyalty, Selfless Service	0.82	6.9	0.85	9.9
Military vs. Civilian- Time for Personal Life			1.18	8.9
Reasons for Joining Army - Job Benefits			1.17	8.3
Reasons for Leaving Army - All Reasons			1.24	15.8
Reasons for Leaving Army - Deviance	0.87	4.6		

Note. For categorical variables unstandardized odds ratios are reported (reference groups are noted in parentheses). For continuous variables, standardized odds ratios are reported. Δ - 2LL = Change in -2LL when the given predictor is removed from the model. Variables that have no odds ratios for a given model were not part of that model. All odds ratios are significant ($p < .05$) except those that are bolded.

Table 4.12. Validity and Utility Statistics for Final Multivariate Models of Medical and Performance Attrition

			Model Validity					Model Utility			
				95% C.I. *c*							
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*	Attrit Rate Top 5%	Attrit Rate Top 10%	Attrit Rate Top 15%	Base Rate
1st Month											
Final Medical Model	20	17	.844	.815	.874	.24	.84	.071	.040	.028	.007
Admin Only	10	5	.724	.685	.763	.09	.30				
BestPred Only	1	1	.729	.687	.772	.12	.43				
BestPred + Admin	12	7	.817	.785	.848	.18	.63	.053	.035	.027	.007
Final Performance Model	12	12	.818	.784	.851	.24	.80	.066	.040	.030	.007
Admin Only	11	4	.739	.704	.775	.08	.29				
BestPred Only	1	1	.717	.674	.759	.13	.45				
BestPred + Admin	13	6	.803	.767	.838	.20	.68	.062	.038	.029	.007
2nd Month											
Final Medical Model	41	31	.772	.750	.793	.21	.48	.109	.080	.065	.019
Admin Only	21	10	.673	.649	.698	.09	.22				
BestPred Only	1	1	.620	.591	.649	.09	.21				
BestPred + Admin	29	12	.727	.704	.750	.14	.34	.081	.066	.058	.019
Final Performance Model	22	14	.757	.734	.780	.20	.46	.105	.080	.062	.019
Admin Only	15	8	.691	.666	.717	.13	.31				
BestPred Only	1	1	.632	.604	.660	.10	.24				
BestPred + Admin	16	9	.743	.719	.767	.18	.42	.103	.073	.061	.019

Note. *df* = Model degrees of freedom (i.e., number of parameters estimated). *k* = Number of model variables. *c* = c-statistic indexing the relationship between probabilities resulting from the given model and attrition criterion. 95% C.I. *c* = 95% confidence interval of *c*-statistic. Lower = lower bound of CI. Upper = upper bound of CI. r_{pb} = Point-biserial correlation. r_{pb}* = Adjusted point-biserial correlation. Attrit Rate Top 5% = Attrition rate among Soldiers scoring in the top 5% of the given model composite (i.e., the predicted probabilities of attrition resulting from the model). Attrit Rate Top 10% = Attrition rate among Soldiers scoring in the top 10% of the given model composite. Attrit Rate Top 15% = Attrition rate among Soldiers scoring in the top 15% of the given model composite. Base rate = Attrition rate in sample on which model is based. Admin Only = Model consisting of administrative variables only. BestPred Only = Model consisting of SRS Attrition Cognitions only. BestPred + Admin = Model consisting of SRS Attrition Cognitions and administrative variables only. All *c* and r_{pb} statistics are significant ($p < .05$).

Deviance Residual Analysis

To determine if the Medical and Performance models were better at identifying some types of attritees than others, we once again examined correlations between the models' deviance residuals and Soldiers' exit survey responses. Results of these analyses are shown in Table 4.13.

Table 4.13. Correlations between Medical and Performance Attrition Model Deviance Residuals and Exit Survey Responses

	1st Month				2nd Month			
	Medical		Performance		Medical		Performance	
Exit Survey Item/Composite	*n*	*r*	*n*	*r*	*n*	*r*	*n*	*r*
02. How Army compared with expectations	97	**.30**	101	.14	272	**.11**	264	-.04
04. Health now vs. Army entry	94	-.05	103	**.17**	271	.06	262	.07
07. Feelings about leaving Army	97	-.13	104	-.02	274	**-.11**	270	.06
11. Advice to male about Army	98	.07	100	-.13	274	**.12**	263	.03
12. Advice to female about Army	99	.12	101	.04	267	**.13**	263	**.13**
Satisfaction								
03a. Satisfied-Recruiter	98	**.19**	104	.12	272	.04	264	.07
03b. Satisfied-Delayed Entry Program	91	.17	100	.13	263	**.16**	250	-.08
03c. Satisfied-MEPS	99	**.18**	102	.13	274	**.15**	265	.02
03d. Satisfied-Reception Station	99	**.22**	103	**.26**	273	.05	267	.04
08. Satisfied with training received	98	**.18**	104	.16	273	**.16**	269	-.06
Reasons for Leaving								
Reasons for Leaving Army - Deviance	99	.15	104	.09	276	**-.13**	272	**.12**
Reasons for Leaving Army - Probl.w/ Supervision	99	-.02	104	.03	276	-.07	272	.04
Reasons for Leaving Army - Problems Adjusting	99	**-.25**	104	-.06	276	-.09	272	-.05
Reasons for Leaving Army - Discrimination	99	.16	104	-.07	276	**-.14**	272	.00
Reasons for Leaving Army - Phys/Med Problems	99	.06	104	-.14	277	.00	272	**-.15**
Helped to Complete your Term								
06a. Accurate PS medical information	98	-.05	104	-.07	274	.00	270	.00
06b. Improve counseling for adjusting	99	**-.31**	104	-.02	272	-.09	272	.01
06c. Realistic preview of Army life	98	**-.29**	104	-.08	273	-.04	271	-.02
06d. Rigorous physical training prior	99	**-.28**	104	-.13	273	-.05	271	-.08
06e. Inform family on support	99	**-.32**	104	.02	271	**-.13**	271	**-.12**
06f. Maintain fair standards	99	**-.23**	104	.03	273	-.07	271	-.05
06g. Collect confidential feedback	98	**-.25**	104	.01	273	-.01	272	-.02
06h. More respect for recruits	99	**-.32**	103	-.12	273	**-.13**	271	-.07
06i. Incentives for good performance	99	**-.23**	104	-.08	274	-.04	271	-.09
06j. Value of Army benefits	99	**-.32**	104	-.13	274	.00	271	-.05

Note. Correlations were calculated for those attritees who had exit survey data. Deviance residuals were squared prior to correlating with exit survey responses. Bolded correlations are statistically significant ($p < .05$, one-tailed).

For Medical models in both months of service we found significantly positive relationships between attritees' residuals and their level of satisfaction with their MEPS and training. Such correlations suggest that the Medical models fit better for attritees who reported being less satisfied with their MEPS and training. Examining relationships between attritees' residuals and their self-reported reasons for leaving revealed few consistent findings. Finally, we examined relationships between attritees' residuals and the degree to which they indicated various types of interventions would have helped them complete their enlistment term. Regardless of the type of intervention (with the exception of obtaining more accurate prior service medical information), it appears that the first month Medical models fit better for attritees who indicated interventions would have been

of great help. This strong pattern of correlation was not found among Medical attritees in the second month of service, nor Performance attritees in either month of service.

Structural Models of BCT Attrition

The primary goal of building and fitting structural models of BCT attrition was to help the Army understand the mechanisms by which the most salient predictors of early attrition (and their antecedents) function. Unlike the empirically driven prediction models described above, here the focus was on explanation and understanding, rather than pure prediction.

Prior to fitting the preliminary structural model (shown in Figure 4.1) to data in the first and second month samples, we fitted an initial exploratory model that included all four deviance components, as well as both medical components described in Appendix H. Although we had good reason to believe that all medical and deviance components would behave as depicted in the model, our theory was not detailed enough to determine if all of these factors were necessary. As such, in the initial exploratory model, they all entered as direct effects on attrition. In the first month sample, this initial model revealed that among the six medical and deviance components, only the Medical I (Medical Waiver/Failure), Deviant II (Deviant Withdrawal Cognitions), and Deviant IV (Non-School Deviance) components had significant direct effects on *overall* attrition after controlling for other direct effects in the model.[24] In the second month sample, the initial model revealed that both medical components, as well as Deviant II, had significant direct effects on overall attrition after controlling for the other effects in the model.

Once we determined which medical and deviance components to retain for the preliminary structural model of overall BCT attrition, we assessed the fit of the preliminary structural model to the data in each month and assessed the significance of its hypothesized paths. Table 4.14 shows model fit statistics for the preliminary structural model as well as the final structural models (described below) for each attrition criterion.

Table 4.14. Model Fit Statistics for Structural Models of BCT Attrition

	1st Month			2nd Month		
Criterion/Model	CFI	TLI	RMSEA	CFI	TLI	RMSEA
Overall Attrition						
Preliminary	.838	.746	.056	.836	.740	.058
Final	.985	.970	.020	.983	.967	.021
Medical Attrition						
Final	.985	.973	.019	.983	.967	.021
Performance Attrition						
Final	.985	.973	.019	.984	.971	.020

Note. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation.

[24] Our modeling efforts initially focused on overall attrition. For this reason we only assessed the fit of the preliminary model using overall attrition as the primary criterion. We used information we gained from work on the overall model to formulate structural models of medical and performance attrition.

Although the RMSEA statistics for the preliminary model indicated it provided reasonable levels of fit to the first and second month data, the CFI and TLI fell far short of standards commonly cited as indicative of good fit (i.e., .95; Hu & Bentler, 1999). As Table 4.14 shows, we were able to achieve good levels of fit for structural models of each attrition criterion through subsequent refinement of the preliminary model.

Final Structural Models of Overall Attrition

The structural models of attrition were composed of four endogenous variables: the primary endogenous variable (i.e., overall attrition), and three secondary endogenous variables, namely Attrition Cognitions, Generalized Self Efficacy, and Stress/Strain. Table 4.15 shows the Multiple R^2 and R (i.e., multiple correlation coefficient) statistics that index the level of prediction obtained for each endogenous variable in the models. As Table 4.15 reveals, we achieved good levels of prediction for all outcomes. As was the case with the predictive models of BCT attrition, the final structural models exhibited a drop in validity (for predicting attrition) between the first two months of service.

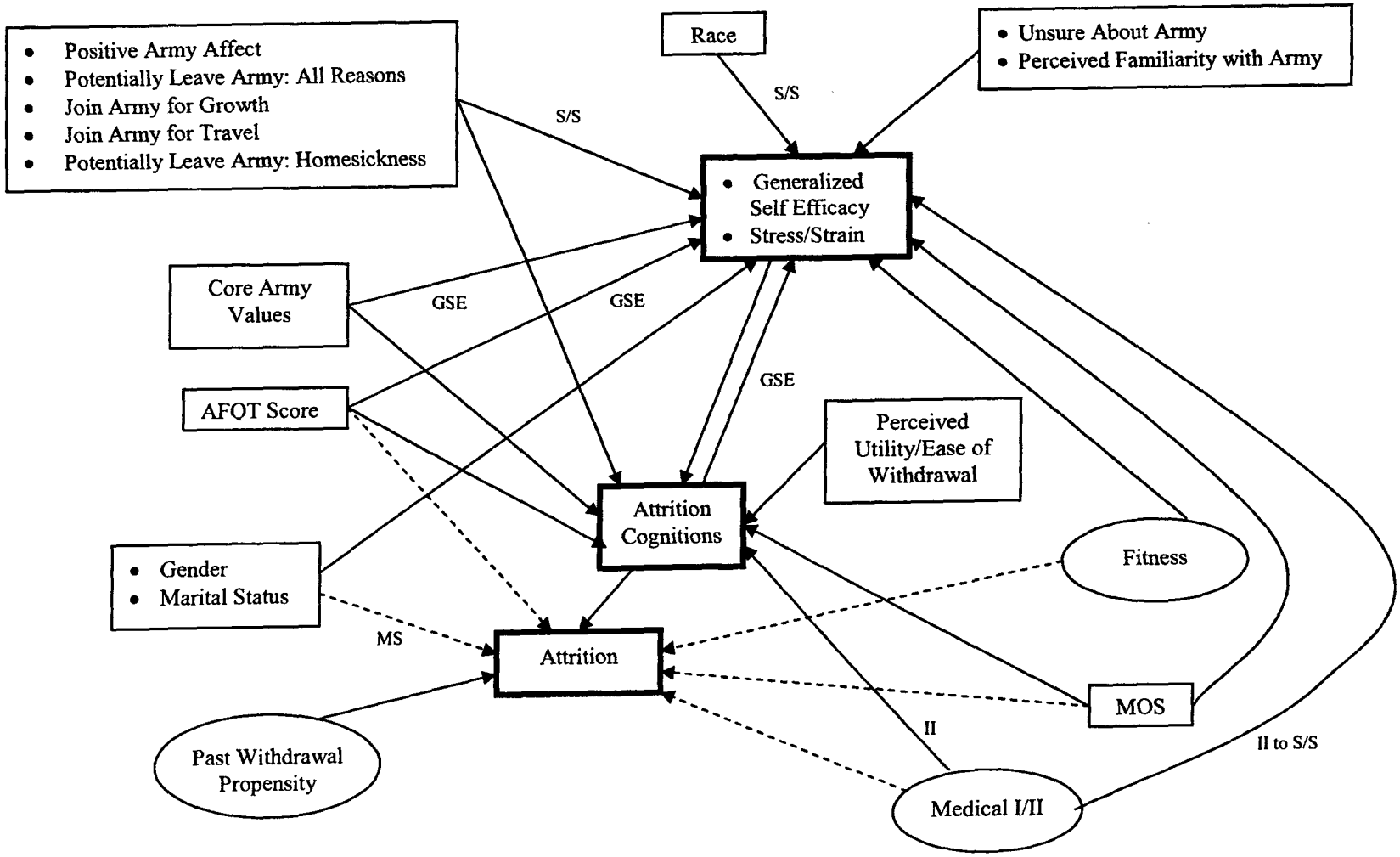
Table 4.15. Multiple R^2 and R Statistics for Endogenous Variables in Structural Models of Overall Attrition

	1st Month		2nd Month	
Outcome	R^2	R	R^2	R
Overall Attrition	.25	.50	.14	.37
Attrition Cognitions	.74	.86	.74	.86
Generalized Self Efficacy	.89	.94	.89	.94
Stress/Strain	.26	.51	.26	.51

Although there was a drop in the structural model's ability to predict attrition across the first two months of service, there were few differences in the structure of the model by month of service. Figure 4.2 shows a diagram of the final structural model of BCT attrition; it depicts statistically significant effects on each of the endogenous variables noted above. The primary difference between the final and preliminary models is that there are fewer *direct* effects on attrition than we had hypothesized in the model (thus the core of the model is simpler), but there are more *indirect* effects on attrition than we had hypothesized (thus the periphery of the model appears more complicated). In the pages that follow, we examine the relative strength of these effects and discuss the role of the demographic variables.

Table 4.16 shows model parameter estimates and Wald statistics for the final structural model of overall attrition in each month of service. Because the path coefficients in this table are raw regression coefficients and many predictors are scaled differently, they are difficult to interpret in terms of their relative magnitude to one another (within models).[25] Thus, we also present the Wald statistic for each path, which serves as a clearer indicator of the strength of the

[25] The path coefficients indexing the direct effect of variables on attrition are probit regression coefficients. M*plus* uses the probit rather than logit link function when modeling dichotomous outcome variables. The path coefficients indexing the effect of variables on the other endogenous variables (i.e., Attrition Cognitions, Generalized Self Efficacy, and Stress/Strain) are linear regression coefficients.



Note. Variables in bolded boxes were modeled as outcomes (*endogenous* variables). Variables in ovals are component scores (indicators omitted to simplify depiction of model; see Appendix H). Variables bulleted within the same box lead to the same endogenous variable(s). Dashed paths were contingent upon month of service or type of attrition examined (e.g., significant for Medical, but not Performance attrition). GSE = Path to Generalized Self Efficacy only. S/S = Path to Stress/Strain only. II = Path from Medical II to Attrition Cognitions only. II to S/S = Path from Medical II to Stress/Strain only. MS = Path from marital status to Attrition was contingent on attrition type and month of service (path for gender was not contingent).

Figure 4.2. Final Structural Model of BCT Attrition (Pre-Training Data Only)

Table 4.16. Model Parameter Estimates and Wald Statistics for Final Structural Models of Overall Attrition

	1st Month		2nd Month	
Outcome/Predictor	*b*	*Wald*	*b*	*Wald*
Attrition				
Intercept	2.31		1.61	
Attrition Cognitions	0.56	13.81	0.41	12.84
Female	0.50	9.48	0.46	11.40
Past Withdrawal Propensity	0.20	10.22	0.15	10.65
Medical II: Medical History Concerns	0.08	4.02	0.07	4.52
Married	0.23	3.76	0.21	4.74
MOS: Combat Service Support	0.35	5.64	-0.09	-2.19
MOS: Combat Support	0.35	5.28	-0.04	-0.94
Medical I: Medical Waiver/Failure	0.04	1.91	0.05	3.34
AFQT Score	0.00	-1.95	0.00	-2.79
Fitness			-0.04	-2.29
Attrition Cognitions				
Intercept	2.14		2.14	
Positive Army Affect	-0.41	-69.76	-0.41	-68.28
Generalized Self Efficacy	-0.29	-44.37	-0.28	-42.59
58. Stress/Strain	0.07	30.34	0.07	29.81
57h. Homesickness	0.20	28.37	0.20	27.86
Utility/Ease of Withdrawal	0.11	23.41	0.11	22.72
Medical II: Medical History Concerns	0.04	15.03	0.04	13.50
Reasons for Potentially Leaving Army- All	0.02	13.69	0.02	13.66
Reasons for Joining Army- Personal Growth	-0.05	-13.03	-0.05	-12.47
Core Army Values	-0.05	-12.11	-0.06	-12.72
AFQT Score	0.00	-10.83	0.00	-10.40
Reasons for Joining Army- Travel	-0.02	-7.11	-0.02	-7.38
MOS: Combat Service Support	-0.04	-4.89	-0.04	-5.35
MOS: Combat Support	-0.02	-2.35	-0.02	-2.88
Generalized Self Efficacy				
Intercept	3.65		3.64	
Attrition Cognitions	-0.65	-84.67	-0.64	-80.83
Fitness	0.21	60.12	0.21	60.21
4. Perceived Familiarity with Army	0.09	24.52	0.09	24.51
Core Army Values	0.09	17.14	0.09	17.02
Unsure About Army Career	-0.05	-15.45	-0.05	-15.90
Female	-0.12	-12.83	-0.11	-11.65
AFQT Score	0.00	8.11	0.00	8.33
MOS: Combat Support	-0.04	-3.93	-0.04	-3.69
Married	0.03	3.00	0.04	3.33
MOS: Combat Service Support	-0.03	-2.71	-0.03	-2.75

Table 4.16. (Continued)

	1st Month		2nd Month	
Outcome/Predictor	*b*	*Wald*	*b*	*Wald*
Stress/Strain				
Intercept	3.61		3.61	
Positive Army Affect	-0.60	-35.24	-0.59	-34.46
Race: Black	-0.52	-25.38	-0.52	-25.13
57h. Homesickness	0.49	21.39	0.49	21.10
Unsure About Army Career	0.14	16.98	0.14	16.96
Reasons for Potentially Leaving Army- All	0.05	14.23	0.05	14.10
Race: Hispanic	-0.34	-13.09	-0.35	-13.16
Race: Other	-0.37	-10.18	-0.37	-10.25
Female	0.24	10.10	0.23	9.39
4. Perceived Familiarity with Army	-0.07	-8.25	-0.07	-8.61
Reasons for Joining Army- Personal Growth	0.08	7.68	0.08	7.60
Medical II: Medical History Concerns	0.06	7.41	0.06	7.17
Fitness	-0.06	-6.89	-0.06	-7.02
Reasons for Joining Army- Travel	-0.05	-6.01	-0.05	-5.78
Married	0.13	5.10	0.13	5.04
MOS: Combat Support	-0.07	-3.16	-0.07	-3.27
MOS: Combat Service Support	-0.04	-2.19	-0.05	-2.45

Note. For each outcome, predictors are sorted in descending order by average magnitude of their Wald statistic across the first two months of service. Paths with Wald statistics that exceed 1.65 are statistically significant ($p <$ .05, one-tailed).

given path relative to others.[26] Results presented in Table 4.16 indicate that the variables with the strongest direct effects on attrition in both the first and second months of service were: Attrition Cognitions, Past Withdrawal Propensity, and gender. Both Medical components had direct effects on attrition in the first two months of service, indicating recruits with pre-service medical problems were more likely to attrit than those without such problems. AFQT score also had a direct effect on attrition, although the effect was small. Interestingly, Fitness only had a small direct effect on attrition in the second month of service. Furthermore, the only effect Fitness had on attrition in month one was indirect (through Generalized Self Efficacy and Stress/Strain, discussed below). Finally, MOS had a direct effect on attrition, but its effect differed notably across months of service. In the first month of service Combat Arms Soldiers were less likely to attrit than Soldiers in other MOS, whereas in the second month of service, the effect was reversed (e.g., Combat Arms Soldiers were more likely to attrit than Combat Service Support Soldiers). No significant difference was found between the attrition rate of Combat Arms and Combat Support Soldiers in the second month of service (after accounting for the other direct effects in the model).

[26] The Wald statistic is calculated by dividing the path coefficient by its standard error. The statistic is asymptotically normally distributed (M=0, SD=1), and as such its significance can be assessed against the standard normal (z) distribution.

Contrary to our initial hypotheses, neither Perceived Utility/Ease of Withdrawal, nor Deviance had direct effects on attrition. The effect of Perceived Utility/Ease of Withdrawal on attrition appeared to be indirect (Perceived Utility/Ease of Withdrawal through Attrition Cognitions), whereas the effect of Deviance was non-existent. Also contrary to our initial hypotheses, Fitness had no direct effect on attrition in the first month of service; and as noted above, its effect in month two was quite weak. Such findings are surprising because BCT has a large physical fitness component to it. Pre-service fitness appeared to have its primary impact on BCT attrition indirectly through Generalized Self Efficacy (i.e., unfit Soldiers feel less confident about being able to succeed in the Army, which in turn leads to higher levels of attrition cognitions, which in turn leads to being at higher risk for attrition).

Given that pre-training Attrition Cognitions appeared to be the strongest predictor of BCT attrition in both months of service, one might ask what underlies Attrition Cognitions. Based on the results in Table 4.16, variables with the strongest direct effects on Attrition Cognitions were Positive Army Affect, Generalized Self Efficacy, Stress/Strain, and SRS Item 57h (Potentially leave Army: Homesickness). That is, Soldiers who had the highest levels of attrition cognitions were those who did not have positive feelings about the Army, were not confident they could succeed, reported high levels of stress prior to entering training, and thought they might leave because they missed home.

Given the importance of Generalized Self Efficacy (GSE) for predicting Attrition Cognitions, results regarding what factors were most predictive of GSE are also of interest. Analyses revealed that the strongest predictors of GSE were Attrition Cognitions, Fitness, and SRS Item 4 (Perceived familiarity with the Army). We had not hypothesized that there would be a reciprocal relationship between GSE and Attrition Cognitions, but the data appear to strongly support it. Thus, Soldiers with the highest levels of GSE were those who had low levels of attrition cognitions, a pre-service history of physical fitness activity, and who reported they were very familiar with that the Army would be like.[27]

Given the importance of Stress/Strain for predicting Attrition Cognitions, results regarding what factors were most predictive of Stress/Strain are also notable. Results indicated that the strongest predictors of Stress/Strain were Positive Army Affect, race, and SRS Item 57h. (Potentially leave Army: Homesickness). We had not hypothesized there would be a relationship between race and Stress/Strain prior to training, but we found minorities (in particular blacks) reported less Stress/Strain prior to training than whites (controlling for other direct effects on Stress/Strain).

Functioning of Demographic Variables

Recall that a secondary purpose in fitting the structural models was to gain a better understanding of how several demographic variables functioned. The models we examined provided insight into the functioning of gender, marital status, education tier, AFQT score, race, and MOS. For example, the models indicated that gender and marital status had both direct and indirect effects on BCT attrition (through GSE and Stress/Strain). The indirect effect of gender

[27] Note, it is important to note that SRS Item 4 reflects *perceived* familiarity. It is not an assessment of *actual* familiarity with the Army.

was such that females tended to be less confident and report more stress/strain than males prior to training, which led to higher levels of attrition cognitions, and in turn, a higher risk of attrition. The indirect effect of marital status was interesting in that although married Soldiers reported higher levels of self efficacy, they also reported higher levels of stress/strain, and in turn were more likely to attrit than single Soldiers. In the preliminary model, we hypothesized that education tier served as an indicator of Past Withdrawal Propensity. As noted above, Past Withdrawal Propensity had one of the strongest direct effects on attrition. With regard to AFQT score, the models revealed that those scores had a small direct effect on attrition, as well as an indirect effect through GSE and Attrition Cognitions. Specifically, the indirect effect was such that Soldiers with high AFQT scores tended to be more confident, experience lower levels of attrition cognitions, and in turn, have a lower risk of attrition than Soldiers with low AFQT scores. The modeling effort revealed that race had no direct effect on attrition, but rather an indirect effect via its relationship with Stress/Strain. The indirect effect was such that minority Soldiers (blacks in particular) reported less stress/strain than white Soldiers, which lead to lower levels of attrition cognitions, and in turn, a lower risk of attrition. Lastly, the models indicated that MOS had both direct (as described above) and indirect effects (through Attrition Cognitions) on attrition.

Final Structural Models of Medical and Performance Attrition

Based on the results of the final structural models of overall BCT attrition, we formulated structural models of Medical and Performance attrition. For the most part, these models were similar to the structural models of overall attrition presented above. Indeed, the direct effects on the secondary endogenous variables (i.e., Attrition Cognitions, Generalized Self Efficacy, Stress/Strain) were structurally identical to the ones in the overall model; however differences *were* found for direct effects on attrition. Tables 4.17 and 4.18 present results for the final structural models of Medical and Performance attrition.[28]

As was the case with the structural models of overall attrition, Table 4.17 shows that the structural models of Medical and Performance attrition were able to predict the endogenous variables quite well.

Results presented in Table 4.18 reveal the structural differences in the Medical and Performance models alluded to above. Perhaps the most striking finding in Table 4.18 is that relatively few variables had direct effects on Performance attrition. The models of Performance attrition indicated that only five variables had direct effects in each month of service. The strongest direct effects on Performance attrition in both months of service were: gender, Attrition Cognitions, and Past Withdrawal Propensity. Beyond that, only MOS had a direct effect on Performance attrition in month one, whereas marital status and AFQT score had a direct effect on Performance attrition in month two. Note that, consistent with our initial hypotheses, neither of the Medical components had direct effects on Performance attrition.

[28] Given the fact that direct effects on the secondary endogenous variables were so similar to those reported for the models of overall attrition, we do not present those effects here. We have provided them in Appendix J for reference.

Table 4.17. Multiple R^2 and R Statistics for Endogenous Variables in Structural Models of Medical and Performance Attrition

	1st Month		2nd Month	
Model/Outcome	R^2	R	R^2	R
Medical				
Medical Attrition	.26	.51	.14	.38
Attrition Cognitions	.73	.85	.73	.85
Generalized Self Efficacy	.89	.94	.89	.94
Stress/Strain	.26	.51	.25	.50
Performance				
Performance Attrition	.15	.39	.09	.30
Attrition Cognitions	.73	.85	.73	.85
Generalized Self Efficacy	.89	.94	.89	.94
Stress/Strain	.26	.51	.25	.50

Table 4.18. Model Parameter Estimates and Wald Statistics for Direct Effects on Attrition in Final Structural Models of Medical and Performance Attrition

	Medical Attrition				Performance Attrition			
	1st Month		2nd Month		1st Month		2nd Month	
Outcome/Predictor	*b*	*Wald*	*b*	*Wald*	*b*	*Wald*	*b*	*Wald*
Attrition								
Intercept	2.52		1.84		2.39		2.00	
Attrition Cognitions	0.63	10.33	0.38	8.52	0.42	7.33	0.31	7.38
Female	0.45	5.60	0.37	6.45	0.42	5.64	0.46	8.70
Past Withdrawal Propensity	0.18	6.48	0.13	6.37	0.18	6.51	0.14	7.30
Medical II: Medical History Concerns	0.12	4.69	0.14	7.46				
Married			0.16	2.65			0.21	3.51
MOS: Combat Service Support	0.29	2.94	-0.23	-4.31	0.33	3.65		
MOS: Combat Support	0.35	3.61	-0.04	-0.77	0.19	1.86		
Medical I: Medical Waiver/Failure	0.06	2.24	0.08	4.47				
AFQT Score			0.00	-2.07			0.00	-1.94
Fitness			-0.08	-3.73				

Note. For each outcome, predictors are sorted in descending order by average magnitude of their Wald statistic across the first two months of service (*q.v.* Table 4.16). Paths with Wald statistics that exceed 1.65 are statistically significant ($p < .05$, one-tailed).

Fewer differences were found between the structural models of Medical attrition and those of overall attrition. For example, the model of second month Medical attrition was nearly identical to that of second month overall attrition, with the exception that the Medical components and Fitness direct effects became stronger, and the Combat Arms-Combat Support differences were attenuated. The model of Medical attrition in the first month of service differed from the model of overall attrition in month one in that no direct effect of marital status or AFQT score on attrition was found for the Medical model.

Assessing the Practical Difference among Models of BCT Attrition

As a final step in the modeling effort, we were interested in comparing the predicted probabilities of attrition resulting from the structural models to predictions resulting from the empirically-driven predictive models presented earlier. Specifically, we were interested in assessing: (a) the extent to which the simpler structural models were able to capture variance in the more saturated, empirically driven predictive models, and (b) the degree to which the structural models could match the criterion-related validities of the predictive models. To answer these questions we generated predicted probabilities of attrition based on variables that had direct effects on attrition in the structural models[29], and examined their pattern of correlations with predicted probabilities resulting from the final predictive models, as well as attrition. In carrying out these analyses we were also able to examine how well models that were optimized for predicting overall attrition were able to predict specific types of attrition (i.e. Medical or Performance).

Table 4.19 shows correlations among different models' predicted probabilities for each attrition criterion *within* each month of service.

Table 4.19. Correlations among Models' Predicted Probabilities of Attrition

	Overall			Medical		Performance	
Criterion/Model	A	B	S	P	S	P	S
Overall Attrition							
Predictive Model A		.88	.85	.76	.73	.81	.81
Predictive Model B	.81		.75	.74	.69	.64	.66
Structural Model	.89	.77		.68	.90	.74	.93
Medical Attrition							
Predictive Model	.80	.71	.79		.75	.43	.53
Structural Model	.85	.70	.94	.81		.53	.70
Performance Attrition							
Predictive Model	.80	.67	.78	.65	.74		.81
Structural Model	.84	.70	.92	.73	.88	.77	

Note. Variables below the diagonal reflect correlations between probabilities from first month models. Variables above the diagonal reflect correlations between probabilities from second month models. "Boxed" values reflect correlations between probabilities for models of the same criterion. A = Final Predictive Model A (no content restrictions). B = Final Predictive Model B (model excludes, gender, race, and MOS), P = Final Predictive Model, S = Final Structural Model (direct effects only). Month 1 n = 25,072 to 27,130. Month 2 n = 22,105 to 26,794. All correlations are statistically significant ($p < .05$, one-tailed).

As revealed in Table 4.19, the correlations among predicted values resulting from the structural and predictive models were quite high. These findings indicate that the simpler structural models were capturing a large amount of the variance in the more saturated predictive models. For example, the correlation between predicted probabilities resulting from the structural model of overall attrition and probabilities resulting from the Final Predictive Model A (of overall attrition) indicate that the structural model accounted for 79% of the variance (i.e., .89 squared) in the predictive model. This high degree of overlap was achieved despite the fact that

[29] For each structural model, we entered the direct effects on attrition from that model into a logistic regression equation predicting the given type of attrition. The predicted probabilities from these analyses are what we refer to as predicted probabilities resulting from our structural models.

the structural model required estimation of only nine parameters, whereas the predictive model required estimation of 18.

Although the results shown in Table 4.19 indicate substantial overlap in prediction resulting from the structural and predictive models, they do not necessitate that the structural models match the predictive models in terms of their validity for predicting attrition. However, examination of the *c*-statistics presented in Table 4.20 reveal that the structural models performed about as well as the predictive models with far fewer parameters (particularly in month one). Indeed, upon cross-validation, one would expect to see higher validities for the structural model compared to the predictive models. Specifically, one would expect more shrinkage among validities for the predictive models due to their notably larger number of parameters, as well as the fact that they were primarily driven by raw empiricism (rather that being informed by theory). Taken together, these findings indicate we were able to capture much of the important variance in the predictive models with the smaller number of direct effects identified in the structural models.

Table 4.20. Comparison of Models' Performance Across Attrition Criteria

		Attrition Criterion					
		Overall		Medical		Performance	
Model	*df*	*c*	SE_c	*c*	SE_c	*c*	SE_c
1st Month							
Overall							
Predictive Model A	19	.830	.010	.840	.015	.809	.018
Predictive Model B	22	.812	.011	.821	.016	.794	.019
Structural Model	9	.819	.011	.825	.016	.804	.018
Medical							
Predictive Model	20	.809	.011	.844	.015	.770	.020
Structural Model	7	.811	.011	.822	.016	.795	.018
Performance							
Predictive Model	12	.799	.011	.775	.018	.818	.017
Structural Model	5	.802	.011	.800	.017	.802	.018
2nd Month							
Overall							
Predictive Model A	30	.741	.008	.731	.012	.737	.012
Predictive Model B	26	.724	.009	.722	.012	.711	.013
Structural Model	10	.722	.008	.706	.012	.717	.013
Medical							
Predictive Model	41	.713	.009	.771	.011	.639	.015
Structural Model	10	.705	.009	.720	.012	.670	.013
Performance							
Predictive Model	22	.714	.008	.654	.013	.757	.012
Structural Model	5	.713	.008	.674	.012	.732	.012

Note. *df* = Model degrees of freedom (i.e., number of parameters estimated, direct effects only). *c* = c-statistic indexing the relationship between probabilities resulting from the given model and attrition criterion. SE_c = Standard error of the *c*-statistic. 95% All *c*-statistics are significant ($p < .05$).

Further examination of Table 4.20 also reveals that the predicted probabilities resulting from the models of *overall* attrition also performed well for predicting Medical and Performance attrition (again, particularly in month one). For example, when predicted probabilities from the structural model of overall attrition in the first month of service were used to predict Medical and Performance attrition in the first month of service, the *c*-statistics were .825 and .804, respectively. Contrast these values with the *c*-statistics found when using the structural models of Medical and Performance attrition for predicting their given type of attrition in the first month of service (.822, and .802), and it is apparent that the overall structural models performed equally as well as structural models targeted specifically to the Medical and Performance attrition criteria. These findings suggest that the factors that are most predictive of BCT attrition in general (e.g. SRS Attrition Cognitions, Past Withdrawal Propensity, Gender), account for much of the predictive variance in the Medical and Performance models. Thus, although differences exist across structural models that make conceptual sense and suggest Medical and Performance attrition are different (e.g., medical factors play a role in structural model of Medical attrition yet not the model of Performance attrition), these differences appear to account for little of the models' overall predictive variance compared to the factors mentioned above.

DISCUSSION

Summary of Key Findings

Below is a summary of the results associated with the eight research questions examined in this chapter. A discussion of how results from this chapter might be leveraged by the Army to reduce BCT attrition is provided in Chapter 9.

1. How does the composition of attrition across the first two months of service differ?

The overall attrition rate for both months of BCT was 6.6%. Performance attrition was more common than Medical attrition in both months of service. In month one, Performance attrition accounted for 46.4% of all attrition that occurred, whereas Medical attrition accounted for 33.5% of attrition. By month two the numbers were a bit more similar, with Performance attrition accounting for 49.4% of all attrition and Medical attrition accounting for 40.4% of all attrition.

2. What pre-training variables have the strongest bivariate relationships with BCT attrition?

Among administrative variables, gender had the strongest bivariate relationship with attrition, followed by MOS. Several survey variables had bivariate relationships with attrition that were stronger than those for gender and MOS, in particular:

- SRS Attrition Cognitions
- SRS Generalized Self Efficacy
- SRS Potential Reasons for Leaving Army- Problems Adjusting
- SRS Item 58: Level of stress/strain

Variables reflecting past withdrawal behavior, emotional stability, core Army values, pre-training physical fitness, and prior medical history were also represented in the list of top

correlates. Notably absent from the list of top correlates were education tier, AFQT category, and variables reflecting past deviant behavior.

Analyses by criterion type (i.e., Medical *v.* Performance attrition) revealed very few differences with regard to which variables had the strongest bivariate relationships with attrition (though the differences that did emerge made conceptual sense). Similarly, analyses by month of service indicated that the very top correlates in month one were also the very top correlates in month two. Nevertheless, there were notable differences in results across months of service. Specifically, the magnitude of relationships between predictors and attrition criteria diminished notably between months one and two. Such findings were expected however, given: (a) the attitudinal underpinnings of many of the SRS variables, (b) the greater temporal distance between month two attrition and the collection of the predictor data, and (c) the range restriction inherent in the predictor data in the "conditional" month two sample (Fishbein & Ajzen, 1975; Hunter & Schmidt, 1990).

3. How well can we predict BCT attrition with models that employ multiple pre-training variables?

All final *predictive* models of first month attrition provided excellent levels of discrimination between attritees and stayers (i.e., *c*-statistics exceeded .80 in magnitude). Analyses of predictions resulting from the less saturated, more theory-driven *structural* models achieved similar levels of prediction. Such results indicate that these models were discriminating between attritees and stayers at levels that were beyond 60% greater than chance. Comparing models across months of service revealed that the first month models had notably higher levels of validity than the second month models. This was consistent with the decrement in bivariate relationships between predictors and attrition that occurred across months of service.

Results regarding the utility of these models for identifying Soldiers at high risk of attrition were also quite strong. Soldiers scoring in the upper percentiles (e.g., top 5%) of the model composites were at notably greater risk for BCT attrition than the average Soldier (e.g., eight times greater for the overall predictive model of first month attrition, five time greater for the overall predictive model of second month attrition). Similarly high levels of validity were found for models of Medical and Performance attrition, as well. Such findings indicate that models consisting only of pre-training data may hold great utility for identifying Soldiers at heightened risk for attrition in BCT.

4. What pre-training variables play the most prominent role in multivariate models of BCT attrition?

Based on the multivariate *predictive* models, the strongest predictors of overall BCT attrition appeared to be:

- SRS Attrition Cognitions
- SRS Item 5 (How long in DEP)
- Gender

These variables were among the top predictors in the multivariate predictive models of Medical and Performance attrition as well. Interestingly, education tier, historically identified as the top predictor of first term attrition, failed to play a large role in the multivariate predictive models of *first* month attrition. In the second month of service, however, it was among the stronger contributors to model fit, yet its effects were still somewhat modest. Another strong contributor to model fit in the second month of service was SRS Potential Reasons for Leaving Army- All.

The *structural* models of attrition revealed a similar story. Specifically, Attrition Cognitions, gender, and Past Withdrawal Propensity (which is indicated by months in DEP, education tier, and other related variables; see Appendix H) had the strongest direct effects on attrition. Also having direct effects on attrition were marital status, AFQT score, MOS (specifically, the Combat Arms, Combat Support, Combat Service Support distinction), medical factors, and Fitness (month two only). The direct effects of AFQT and Fitness were fairly weak.

Although analyses of structural models by attrition type revealed that Attrition Cognitions, gender, and Past Withdrawal were among the strongest direct effects on attrition, differences were apparent. Namely, medical factors had no direct effects on Performance attrition, and their direct effects on Medical attrition were stronger than they were for overall attrition. Furthermore, few variables had a direct effect on Performance attrition beyond the three mentioned above. Specifically, the only additional variables that had direct effects on Performance attrition were MOS (in month one only) and marital status and AFQT score (in month two). The model of Medical attrition in the first month of service differed from the model of overall attrition in month one in that no direct effect of marital status or AFQT score on attrition was found for the Medical model.

5. Can we achieve similar levels of prediction with models that exclude variables that cannot be used in a selection context (e.g., gender, race, MOS)?

Within both months of service, the validity of multivariate predictive models that *allowed* gender, race and MOS to enter *were not* substantially greater than the validity of models that excluded these variables. Though differences were apparent, explicit exclusion of gender, race, and MOS did not significantly harm our ability to form multivariate predictive models that were highly predictive of BCT attrition.

6. Are the models of BCT attrition we form better at identifying some types of attritees than others?

Results of correlational analyses with deviance residuals resulting from the predictive models and attritees' exit survey responses suggest that the models of overall attrition fit better for attritees who: (a) were less satisfied with training and the entry process, and (b) strongly felt that various interventions would have helped them complete their term of enlistment. This pattern of findings was stronger for first month than second month models of attrition.

As a follow-up to the exit survey analyses, we examined the correlation between overall model residuals (based on the first month sample) and Soldiers' day of attrition from BCT

(across both months). Analyses revealed a significant positive correlation (r = .34) between these variables, indicating that the overall predictive model fit better for attritees who attrited earlier in BCT. This finding was quite consistent with the smaller bivariate relationships and model validities observed in the second month of service.

7. Can we identify a good fitting structural model that helps us understand the processes that underlie BCT attrition?

We were able to identify a structural model that not only provided excellent fit to the data, but also aided in the understanding of the processes by which pre-training variables may come to impact attrition. Unlike the empirically driven predictive models, the structural models suggest that very few factors have direct effects on BCT attrition. The variables identified as having the strongest direct effects on BCT attrition were Attrition Cognitions, Past Withdrawal Propensity, and gender. These variables were found to perform well regardless of when attrition occurred (first or second month) and the type of attrition examined (Medical *v.* Performance). Other variables we hypothesized to have direct effects on attrition either had indirect effects (e.g., perceived utility/ease of withdrawal) or no effect whatsoever (e.g., pre-service deviance).

In addition to determining which variables had direct effects on attrition, the structural models provided insight into factors that had indirect effects (i.e., those that underlie the direct effects on attrition). For example, the models revealed that the primary antecedents of Attrition Cognitions (i.e., the variable with the strongest direct effect on BCT attrition) were: Positive Army Affect, Generalized Self Efficacy, Stress/Strain, and SRS 57h (Potentially leave Army: Homesickness). That is, Soldiers who had the highest levels of attrition cognitions were those who didn't have positive feelings about the Army, were not confident they could succeed, reported high levels of stress prior to training, and were concerned they might leave because they missed home.

Given the importance of Generalized Self Efficacy (GSE) for predicting Attrition Cognitions, it is worth noting that the structural model also provided information on what factors had the strongest direct effects on GSE. The strongest predictors of GSE were Attrition Cognitions (suggesting a reciprocal link), past physical fitness (as captured by Fitness), and perceived familiarity with the Army (SRS Item 4). It is interesting to note that past physical fitness appeared to primarily impact BCT attrition indirectly through its effect on GSE and Stress/Strain.

Given the importance of Stress/Strain for predicting Attrition Cognitions, it is also worth noting that the structural models provided information on what factors had the strongest direct effects on Stress/Strain. They were: Positive Army Affect, race, and SRS Item 57h (Potentially leave Army: Homesickness). We had not hypothesized there would be a relationship between race and Stress/Strain prior to training, but we found minorities (in particular blacks) reported less Stress/Strain prior to training than whites (controlling for other direct effects on Stress/Strain).

8. To what extent do predictions from theory-driven structural models of attrition overlap with predictions resulting from empirically driven predictive models of attrition, and further, match their criterion-related validity?

Comparison of predictions resulting from the multivariate predictive and structural models revealed a high degree of overlap. Such results indicate that the simpler, theory-driven structural models were accounting for the majority of variance in the more saturated, empirically driven predictive models. Furthermore, the validity of the structural models for predicting attrition nearly matched that of the multivariate predictive models. We hypothesized that upon cross-validation, one would expect to see higher validities for the structural models compared to the predictive models. Specifically, one would expect more shrinkage in validities of the predictive models to occur due both to their larger number of parameters, as well as the fact that they were primarily driven by raw empiricism (rather than being informed by theory). Taken together these findings indicate we were able to capture much of the important variance in the empirically-driven predictive models of attrition with the smaller number of direct effects identified in the structural models.

Conclusions

The results presented in this chapter provide insight into the composition, prediction, and understanding of BCT attrition. Nearly 20% of all first-term attrition among the FY99 cohort occurred during the first two months of service. Not surprisingly, the majority of this attrition was linked to ISCs that reflected medical and performance-related issues. Such findings suggest that the Army might be able to lower first-term attrition by making efforts to reduce BCT attrition.

To reduce BCT attrition, it is important to identify factors that distinguish between Soldiers who attrit in BCT and those who do not. A number of the research questions in this chapter were aimed at identifying the best predictors of BCT attrition. As part of this process, we considered hundreds of potential predictors that were either available through administrative records or obtained from Soldiers' responses to the SRS. Further, we considered not only simple bivariate relationships between each predictor and BCT attrition, but also the relationship between predictors and BCT attrition in the context of multivariate models. Our analyses revealed that the top predictors of BCT attrition were consistent with those typically found in the literature on civilian turnover (e.g., thoughts of leaving, stress/strain, emotional stability, lack of confidence, past withdrawal behavior). Other top predictors, however, were more specific to the Army context (e.g., time in DEP, pre-training physical fitness, medical history, core Army values, gender).

Although identifying single factors that distinguish BCT atrittees from Soldiers who complete BCT is important, such information is not necessarily helpful by itself for understanding why Soldiers attrit. For example, the very top predictor of BCT attrition was a variable we called "attrition cognitions," which reflected the extent to which Soldiers had thoughts of attriting before they even began training. Although this knowledge is useful, it begs the question, "What leads some Soldiers to have these thoughts, and others not to have them?" For this reason, we also examined structural models of BCT attrition to understand how the top

predictors "work together" to affect BCT attrition and to understand the factors that underlie them. In general, these models were quite consistent with models of civilian turnover; at the same time, they differed in ways that were consistent with our expectations given (a) differences between BCT attrition and civilian turnover, and (b) the type of predictors examined (e.g., pre-training attitudes, rather than in-service attitudes). For example, pre-service physical fitness and pre-service medical history played a role in models of BCT attrition, whereas they are not part of civilian turnover models. Furthermore, *pre-training* positive feelings about the Army, self-confidence, perceived stress/strain, and homesickness were the primary drivers of attrition cognitions in our structural model of BCT attrition; in the civilian literature, attrition cognitions are often modeled as functions of job satisfaction and perceived utility of withdrawal (Hom & Griffeth, 1995).

As in Chapter 3, we also observed a decrement in the predictiveness of many of the variables we examined over time—even by the second month of service. This was consistent with our expectations based on both the civilian turnover literature and the social psychology literature on attitude-behavior relations (Fishbein & Ajzen, 1975; Hom & Griffeth, 1995). The civilian turnover literature suggests that turnover intentions (equivalent to our "attrition cognitions") and the attitudinal variables that underlie them are the primary determinants of turnover. The social psychology literature indicates that the intentions and attitudes most relevant to any behavior are those assessed most proximally (in time) to the behavior in question. Thus, intentions and attitudes assessed *prior to* training (which play an important role in the overall model of BCT attrition) will naturally become less relevant for predicting 2nd month attrition compared to 1st month attrition. What these findings suggest is that we might have been able to predict 2nd month BCT attrition better if we had re-assessed attrition cognitions and its attitudinal antecedents a few weeks into BCT. They also speak to the importance of maintaining an up-to-date awareness of Soldiers' intentions and attitudes to understand their risk for attrition in the months that follow.

In sum, the analyses in this chapter revealed several variables and models that might be useful for identifying recruits at heightened risk for BCT attrition. As an example of just how useful these models might be, we found that Soldiers scoring in the top 5% of our 1st month BCT empirical attrition model (15% attrition rate, Model A) were 8.3 times more likely to attrit than the average Soldier (1.8% attrition base rate). Though impressive, it is important to remember that 85% of Soldiers in the top 5% of this 1st month BCT model actually completed their first month of BCT. Thus, if this model were used to identify high-risk recruits, the rate of "false positives" would be extremely high. As such, careful thought should be given to how such information is used so that the impact on false positives is minimal (similar to the strategy used in the GED Plus Program, where some recruits who would otherwise be turned away can be identified as low-risk recruits who should be allowed to join). Regardless, it appears the Army may benefit by moving beyond education tier as the primary means of identifying recruits at high risk for BCT attrition through consideration of variables identified in this chapter. With such information, the Army might potentially design a number of interventions to reduce BCT attrition. Recommendations on how the Army could capitalize on this information are presented in Chapter 9.

Generalizability of Results to Future Cohorts

Finally, it is worth noting the results of a recent effort by ARI to assess the generalizability of the findings discussed in this chapter to cohorts other than the FY99 cohort. Specifically, Putka and Strickland (2004) suggest that the FY03 and FY99 cohorts are quite similar. Though some differences were found (e.g., FY03 cohort members expressed a higher desire to serve their country as a reason for joining the Army relative to FY99 cohort members), these differences did little to diminish the predictive validity and utility of variables and models identified as salient predictors of BCT attrition in the FY99 cohort. In light of these findings, the conclusions drawn here regarding BCT attrition based on the FY99 cohort appear to generalize well to other, more recent cohorts.

CHAPTER 5: MODELING ADVANCED INDIVIDUAL TRAINING ATTRITION

Chad H. Van Iddekinge

OVERVIEW

In this chapter we focus on understanding and predicting attrition from advanced individual training (AIT). As noted in Chapter 2, we defined Basic Combat Training (BCT) attrition as attrition that occurred during the first two months of service. This chapter addresses attrition immediately subsequent to this period. Below are the main research questions we attempt to answer in this chapter.

1. What is the nature of AIT attrition?
2. What "pre-training" variables best predict AIT attrition?
3. What post-BCT variables best predict AIT attrition?
4. Do pre-training data provide incremental validity beyond the more proximal "post-training" data in predicting AIT attrition?
5. Does the validity of pre- and post-training predictors of AIT attrition vary over time?
6. Do changes between pre- and post-training attitudes predict AIT attrition?
7. What is the structural model of AIT attrition?

METHOD

Sample

The sample for the analyses described in this chapter comprised primarily Soldiers from Combat Support and Combat Service Support (91.9%) military occupational specialties (MOS) who passed BCT and moved on to AIT for their MOS. The total number of Soldiers in the overall sample we examined was 38,938. As noted below, not all of these Soldiers completed the various predictor measures of interest. Thus, the sample sizes for many of the analyses were smaller than this figure.

Data

Predictors

We examined two main sets of predictor variables in this chapter. The first set was collected from Soldiers prior to their entering BCT. These predictors included demographic and background information from Army administrative records (e.g., gender, education, enlistment waivers) and data collected at reception via the Soldier Reception Survey (SRS). We refer to

these predictors hereafter as "pre-training" variables. The second set of predictors was gathered after Soldiers completed BCT via the End-of-Training Survey (EOTS). We refer to these predictors as "post-training" variables. We also examined the predictive validity of Assessment of Individual Motivation (AIM) scores and BCT Red Phase performance ratings. Although we examined bivariate relations between attrition and scores on these measures, we did not incorporate them into the attrition models we developed because the First Term database included AIM and Red Phase data for only a limited number of cohort members.

Table 5.1 displays demographic information for Soldiers who comprised the analysis samples discussed in this chapter, along with the demographics for the entire FY99 cohort. Of the 38,938 Soldiers in the overall sample, 16,543 completed the SRS, 21,243 completed the EOTS, 8,299 completed the AIM, and 1,279 had Red Phase performance data.

Criterion

As mentioned, the criterion of interest in this chapter was attrition from AIT. We examined overall attrition, as well as the two most common reasons why Soldiers failed to complete AIT, namely performance- and medical-related attrition. Because the analysis sample comprised only Soldiers who did not attrit during BCT, the AIT attrition variable is a conditional criterion.

Analyses

The analyses performed to address the research questions of interest were very similar to those described and reported in Chapter 4. In short, we assessed relationships between attrition and the pre- and post-training predictors by examining (a) bivariate relations, including changes in predictors and predictor-criterion relations over time, (b) multivariate prediction models, and (c) structural models of AIT attrition. The results of these analyses are discussed in turn.

RESULTS

Nature of AIT Attrition

Our first and most basic concern was to understand the nature of AIT attrition. Specifically, we wanted to know how many Soldiers in this sample attrited during AIT, when they attrited, and why they attrited. Table 5.2 shows the attrition rate for Soldiers in this sample by month of AIT. One-half of all AIT attrition (50.7%) occurred in the first month, and almost 80% of attrition occurred within the first two months of AIT. The majority of attrition within this sample (83.9%) was accounted for entry-level performance and conduct (54.8%) and medically unqualified for active duty (29.0%).[30] The next largest category was attrition due to homosexuality (1.9%).

[30] Attrition due to entry-level performance and conduct is designated by interservice separation code (ISC) 87, and attrition due to being medically unqualified for active duty is designated by ISC 16.

Table 5.1. Demographic Composition of Analysis Samples vs. FY99 Cohort

	FY99 Cohort		Overall Sample		SRS Sample		EOTS Sample		AIM Sample		Red Phase Sample	
Group	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Gender												
Male	51,107	79.9	29,158	74.9	13,099	79.2	16,436	77.4	6,861	82.7	849	66.4
Female	12,823	20.1	9,780	25.1	3,444	20.8	4,807	22.6	1,438	17.3	430	33.6
Race												
White	38,361	60.0	20,807	53.4	9,276	56.1	11,611	54.7	4,701	56.6	681	53.2
Black	15,325	24.0	11,576	29.7	4,584	27.7	6,046	28.5	2,258	27.2	398	31.1
Hispanic	6,890	10.8	4,378	11.2	1,777	10.7	2,383	11.2	909	11.0	125	9.8
Other	3,354	5.2	2,177	5.6	906	5.5	1,203	5.7	431	.52	75	5.9
AFQT Category												
I	2,306	3.6	1,202	3.1	496	3.0	661	3.1	322	3.9	34	2.7
II	18,799	29.4	11,353	29.2	4,939	29.8	6,177	29.1	2,420	29.2	407	31.8
IIIa	18,247	28.5	11,199	28.8	4,601	27.8	6,056	28.5	2,309	27.8	400	31.3
IIIb	22,447	35.1	14,019	36.0	6,167	37.3	7,809	36.8	2,960	35.7	425	33.2
IV-V	2,009	3.1	1,092	2.8	330	2.0	518	2.4	280	3.4	13	1.0
Education Tier												
1	55,432	86.7	34,113	87.9	14,526	88.1	18,797	88.8	6,545	78.9	1,256	98.2
2	7,966	12.5	4,501	11.6	1,869	11.3	2,279	10.8	1,678	20.3	18	1.4
3	285	0.4	180	0.5	87	0.5	94	0.4	31	0.4	5	0.4
Totals	63,938		38,938		16,543		21,243		8,299		1,279	

Note. SRS sample = Soldiers in overall sample with SRS survey data. EOTS sample = Soldiers in overall sample with EOTS data. AIM sample = Soldiers in overall sample with AIM data. Red Phase sample = Soldiers in overall sample with BCT Red Phase ratings data. Because demographic data were missing for a small number of Soldiers, subgroup sample sizes do not always sum to the "totals," and percentages do not always sum to 100%. In addition, actual analysis sample sizes may be smaller than the totals listed here due to missing survey data at the item-level.

The attrition base rates for the various samples of Soldiers examined in this chapter are displayed in Table 5.3. Base rates are shown for overall attrition and the two most common reasons for AIT attrition (i.e., performance and medical attrition). Two points from this table are noteworthy. First, the base rate of attrition within this sample is extremely low (e.g., 1.97% for Soldiers who completed the EOTS at the end of BCT), which made the prediction of AIT attrition that much more difficult. Second, we intended to develop models for predicting different types of attrition. However, even the performance and medical attrition categories did not include enough Soldiers to provide stable model estimates. Thus, with the exception of the pre-training data models, we limited the analyses to the prediction of overall AIT attrition.

Table 5.2. AIT Sample Life Table

Month in AIT	Total Entering	In-Service	Attrited	Hazard	Cumulative Attrition Rate	Proportion of Attrition	Cumulative Proportion of Attrition
1	38,951	37,839	1,112	.029	.029	.507	.507
2	34,170	33,536	634	.019	.045	.289	.796
3	20,910	20,672	238	.011	.051	.108	.904
4	11,895	11,790	105	.009	.054	.048	.952
5	5,814	5,764	50	.009	.055	.023	.975
6	2,633	2,616	17	.006	.055	.008	.983
7	1,517	1,506	11	.007	.056	.005	.988
8	1,159	1,149	10	.009	.056	.005	.992
9	702	694	8	.011	.056	.004	.996
10	358	352	6	.017	.056	.003	.999
11	69	66	3	.043	.056	.001	1.00
12	2	2	0	.000	.056	.000	1.00

Note. Total Entering = number of Soldiers entering the Army in the given month of AIT. In-Service = number of Soldiers still in service at the end of the given month. Attrited = number of Soldiers who attrited during the given month. Hazard = proportion of Soldiers who attrited among those who entered AIT during the given month. Cumulative Attrition Rate = proportion of Soldiers who attrited during or before the given month. Proportion of All Attrition = proportion of Soldiers who attrited during the given month. Cumulative Proportion of All Attrition = proportion of Soldiers who attrited during or before the given month.

Attrition hazard analysis was used to determine when attrition occurred during AIT. The attrition hazards for each sub sample and the overall sample are presented in Figure 5.1. Note that the number of Soldiers who entered AIT (i.e., Total Entering) dropped precipitously after the first few months. This was because the length of AIT for many MOS is only 2-3 months (see Appendix C). Given that almost all of AIT attrition (97.5%) occurred in the first five months of training, we chose to model attrition only for this period. As shown, the hazard for the overall sample was represented by a linear trend whereby the attrition rate was highest in the first month of AIT and steadily decreased thereafter until it leveled off during month 4.

As for the individual samples, the hazard for Soldiers who completed the AIM was quite similar to that of the overall sample with the exception that the attrition rates for this sample in months 1 and 2 were almost identical. The attrition rate in months 4 and 5 were also somewhat lower relative to the overall sample. The hazard for Soldiers in this sample who completed the SRS was also very similar to the overall sample, although the attrition rate for the SRS sample was somewhat lower during months 3-5. As for those with BCT Red Phase performance ratings, the majority of attrition occurred in month 1 and then leveled off until month 5 when no one from this sample attrited. Please note, however, that Soldiers with Red Phase ratings comprised only a small percentage of the overall sample, and included less than 2% of those who attrited during AIT. Thus, this pattern of attrition should be interpreted with caution. Finally, the hazard for Soldiers who completed the EOTS (after BCT) was markedly different from the hazards of other analysis samples. The relatively lower and less varied attrition rate for this sample is likely an artifact of how we classified attrition than to substantive differences between this and the other samples. Although the length of BCT is fixed, some Soldiers have to retake portions of BCT (i.e., they are "recycled") and/or have to wait for an open spot in AIT. Thus, we were unable to

determine the precise date on which such individuals began AIT. As a result, it is likely that some of the Soldiers who we considered in AIT were, in fact, still finishing BCT. Given this, the attrition rate would naturally be lower for those with EOTS data who, of course, had to still be in the Army to complete this survey.

Table 5.3. AIT Attrition Rates for Subsets of Soldiers in this Sample

Sample	*n*	Stayed	Attrited	Base Rate
Overall Sample				
Performance Attrition	37,947	36,744	1,203	3.27
Medical Attrition	37,381	36,744	637	1.73
Overall Attrition	38,938	36,744	2,194	5.97
SRS Sample				
Performance Attrition	16,133	15,660	473	3.02
Medical Attrition	15,946	15,660	286	1.83
Overall Attrition	16,543	15,660	883	5.64
EOTS Sample				
Performance Attrition	21,067	20,833	234	1.12
Medical Attrition	20,912	20,833	79	0.38
Overall Attrition	21,243	20,833	410	1.97
AIM Sample				
Performance Attrition	8,035	7,760	275	3.54
Medical Attrition	7,935	7,760	175	2.26
Overall Attrition	8,299	7,760	539	6.95
BCT Red Phase Ratings Sample				
Performance Attrition	1,262	1,235	27	2.19
Medical Attrition	1,246	1,235	11	0.89
Overall Attrition	1,279	1,235	44	3.56

Note. SRS = Soldier Reception Survey. EOTS = End-of-Training Survey. AIM = Assessment of Individual Motivation. BCT = Basic Combat Training.

Predicting AIT Attrition

One of the main objectives of this chapter was to determine the individual, organizational, and extra-organizational factors that predict attrition from AIT. As discussed, we modeled AIT attrition using data collected before and after BCT. Pre-training data included demographic and background information from Army administrative records (e.g., gender, education, enlistment waivers) and data collected at reception via the SRS. Post-training data consisted of information from the EOTS, which was administered to Soldiers upon completion of BCT. We refer to this as "post-training" data. We also examined bivariate relations between attrition and scores on the AIM and BCT Red Phase performance ratings.

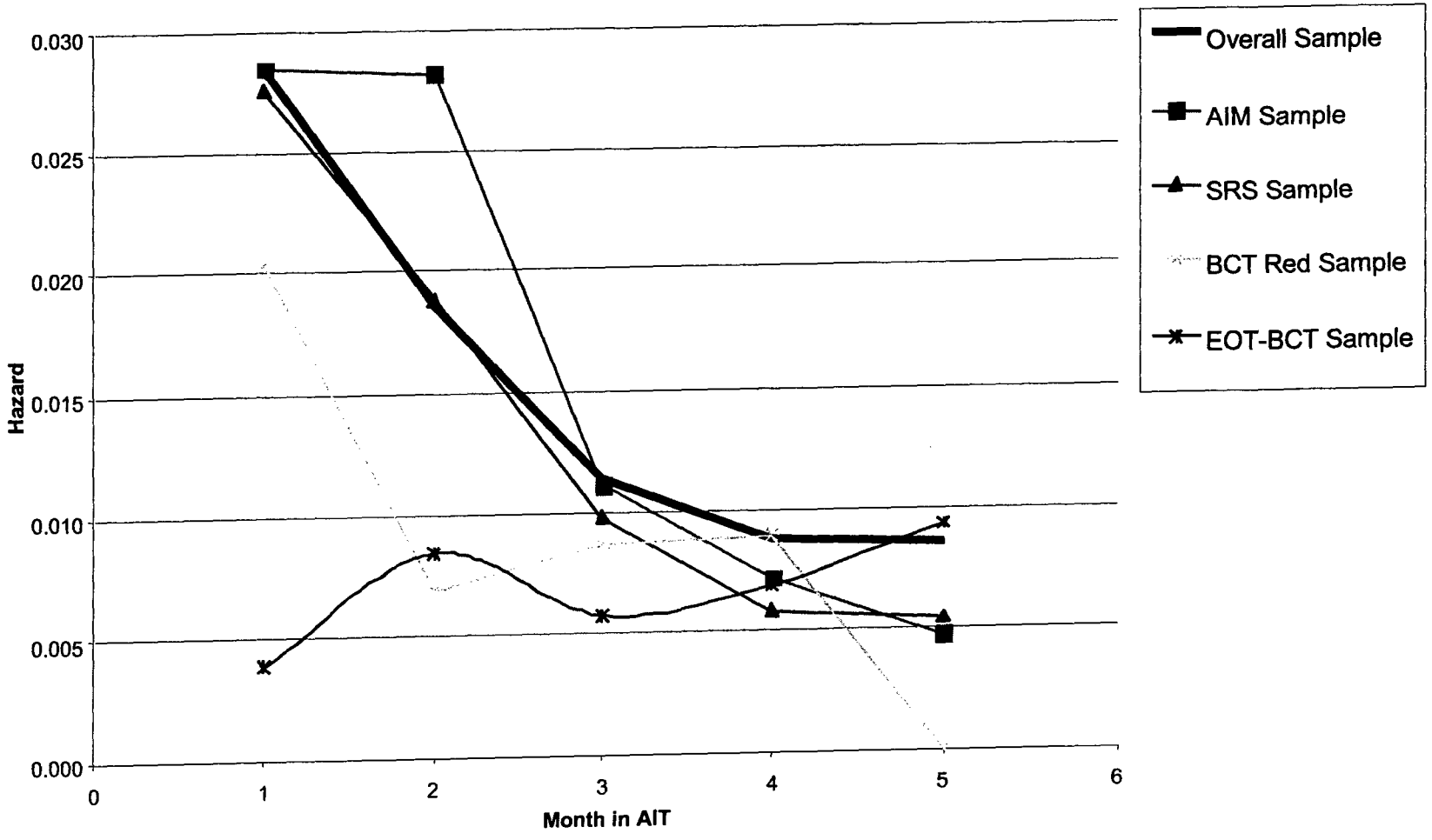


Figure 5.1. Hazards for AIT Attrition by Month in AIT

Pre-Training Data Models

Overall Attrition

We began by modeling overall AIT attrition using the SRS and administrative (hereafter referred to as "admin") data available to the Army before Soldiers began BCT. We first calculated bivariate relations between these variables and attrition. Next, we evaluated multivariate models of survey and admin data that optimized the prediction of overall attrition. We followed this same process for developing models to predict performance and medical attrition. As mentioned, we did not include AIM variables in the pre-training multivariate models because the AIM was administered to only 21% of Soldiers in this sample. Fewer than 6,000 Soldiers had AIM, SRS, and admin data, whereas over 16,000 had SRS and admin data. Thus, including AIM variables would have severely restricted the sample sizes for these models.

Relations between the examined variables and attrition reported in this chapter are, in general, quite modest. However, it is important to note that factors other than true predictor-attrition relations likely contributed to these modest relations. These factors include the extremely low attrition base rates within this sample and the dichotomous nature of the attrition criterion. In addition, range restriction on the predictor variables due to prior attrition (during BCT) may have also attenuated the relations between post-training attitudes and attrition (discussed later in this chapter).

Bivariate relationships. Table 5.4 presents the zero-order validity coefficients and area under the curve (*c*) statistics for the admin variables, single-item SRS variables, and SRS and AIM composites that had correlations of +/-.03 and larger with overall AIT attrition[31]. Predictor-attrition relations were generally quite modest, with all single variables and composites correlating with attrition below +/- .10. Likewise, all *c* statistics for these variables were less than .60. Among the admin variables, gender was the best predictor of overall attrition. In fact, females were 1.88 times more likely to attrit than males. The most predictive survey variables included a mix of physical, attitudinal, deviance, and past withdrawal items. Several of the most predictive SRS single items assessed physical-related factors, including participation in athletics in high school, likelihood of attrition due to physical reasons, and average fitness level before entering the Army. As for the composite variables, AIM Physical Condition, which was the most predictive pre-training variable (r = .09), SRS Generalized Self Efficacy, and SRS Attrition Cognitions were most related to attrition.

Time-varying effects. We then examined whether the fit of individual pre-training variables varied across the first five months of AIT. Table 5.5 displays the fit statistics for variables that (a) had a statistically significant time-varying effect and/or (b) contributed to one or more of the multivariate prediction models discussed in this chapter. Displayed are the log likelihood statistics for models that include the intercept only (Step 1), the intercept and fixed effect (Step 2), and the intercept, fixed effect, and time-varying effect (Step 3). Also shown is the change in deviance (□-2 LL) from Step 2 to Step 3, and the percentage of improved fit (from

[31] In this and subsequent tables, refer to the survey booklets in Appendix A for the precise wording of the questions in the various surveys. In each table, we identify the survey and the question/response option number, and provide only a very short extract. The wording of the question stem is often crucial to understanding that extract.

Step 1 to 3) attributable to the time-varying effect. Predictor variables are designated as "time varying" if they interacted significantly with time and "fixed" if the time-varying effect was statistically nonsignificant.

Table 5.4. Zero-order Validity Coefficients and c Statistics for Pre-Training Variables Predicting Overall AIT Attrition

Variable	*n*	*r*	*c*	SE_c
Administrative				
Gender	38,938	.07	.567	.007
Ethnicity	38,938	.04	.546	.006
Education Tier	38,794	.04	.525	.007
Pay Grade (at entry)	38,938	.03	.532	.006
Medical Failure - weight	38,938	.03	.512	.006
CMF Category	38,930	.03	.516	.006
SRS Single Items				
Participated in athletics during high school (26a)	16,087	-.07	.586	.010
Likelihood of attrition for physical reasons (57a)	16,363	.07	.562	.011
Average fitness level before Army (35)	16,512	-.07	.579	.010
Never thought about quitting high school (25a)	16,188	-.06	.562	.010
Time in DEP (5)	16,351	-.05	.564	.010
Smoking before DEP (42)	16,491	.05	.550	.010
Level of strain, conflict, or stress (58)	16,489	.05	.559	.010
Drinking before DEP (43)	16,491	.05	.549	.010
Advise male about joining Army (52)	16,412	-.04	.529	.010
Current level of morale (59)	16,502	-.03	.527	.010
Advise female about joining Army (53)	16,420	-.03	.524	.010
AIM and SRS Composites				
AIM Physical Condition	8,282	-.09	.594	.013
SRS Generalized Self Efficacy	16,529	-.07	.561	.011
SRS Attrition Cognitions	16,543	.06	.551	.011
SRS Thoughts of Quitting High School	16,188	.05	.563	.010
AIM Adjustment	8,267	-.05	.548	.013
AIM Agreeableness	8,272	-.04	.541	.014
SRS Possible Reasons for Leaving Army - Problems Adjusting	16,407	.04	.534	.010
AIM Work Orientation	8,273	-.03	.532	.013
SRS Participation in DEP Activities	16,435	-.03	.535	.010
SRS Trouble in School	16,191	.03	.522	.010
SRS Reasons for Quitting Previous Jobs	16,401	.03	.530	.010

Note. Survey item numbers are in parentheses. r = zero-order correlation. c = area under the curve statistic. SE_c = standard error of c statistic. Variables appear in descending order by absolute magnitude of r. All r and c statistics were significant ($p < .05$).

Table 5.5. Fit Statistics for Time-Varying and Fixed Pre-Training Variables across the First Five Months of AIT

Variable	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Vary Effect (Step 3)	Δ-2LL (2 vs. 3)	% Step 3
Time-Varying					
CMF Category	20,786	20,779	20,720	59	89.4
Uncertainty about Army career (54a)	8,391	8,389	8,377	12	85.7
AIM Work Orientation	4,933	4,922	4,910	12	52.2
AIM Adjustment	4,932	4,910	4,891	19	46.3
Required a medical waiver (40)	8,377	8,371	8,366	5	45.5
AFQT Category	20,779	20,741	20,711	30	44.1
SRS Attrition Cognitions	8,426	8,362	8,346	16	20.0
Likelihood of attrition for physical reasons (57a)	8,313	8,240	8,230	10	12.0
Required a moral waiver (39)	8,395	8,395	8,394	0	0.0
Fixed					
Military vs. Civilian Life - Time for Personal Life	8,307	8,306	8,302	4	80.0
Number of Dependents (at entry)	20,794	20,784	20,761	23	69.7
Possible Reasons for Leaving Army - Discrimination	8,314	8,309	8,300	9	64.3
BMI category	20,793	20,784	20,774	10	52.6
Joined Army to make it a career (1u)	8,329	8,327	8,326	1	51.9
Required a physical waiver	20,793	20,786	20,779	7	50.0
Medical failure - physical extremities	20,793	20,786	20,780	6	46.2
Drinking before entering DEP (43)	8,385	8,379	8,376	3	33.3
ASVAB Word Knowledge	20,778	20,762	20,755	7	30.4
Ethnicity	20,794	20,745	20,731	14	22.2
Likelihood of attrition for medical reasons (57g)	8,265	8,249	8,246	3	15.8
Education Tier	20,733	20,689	20,682	7	13.7
Level of strain, conflict, or stress (58)	8,399	8,365	8,361	4	10.5
Time in DEP (5)	8,322	8,280	8,277	3	6.7
Marital Status (at reception)	8,426	8,395	8,393	2	6.1
Participated in athletics during high school (26a)	8,171	8,090	8,086	4	5.1
Never thought about quitting HS (25a)	8,271	8,214	8,211	3	5.0
Gender	20,794	20,596	20,588	8	3.9
Average fitness level before Army (35)	8,409	8,332	8,329	3	3.8
Smoking before DEP (42)	8,396	8,367	8,366	1	3.3

Note. Time-varying predictors differentially predicted attrition across the first five months of AIT, whereas fixed predictors are those whose validity did not vary over time. Δ-2 LL (2 vs. 3) = change in -2 log likelihood when the time-varying effect for the predictor (Step 3) was added to the intercept and fixed effect model (Step 2). % Step 3 = percentage of Δ-2 LL accounted for by the time-varying effect. Predictors within category appear in descending order by % Step 3.

As shown, the fit of the majority of pre-training variables did not vary significantly across the first five months of AIT. This was not surprising given that the measurement of these variables was relatively distal to the attrition event, and thus it seems unlikely that an additional month or two would greatly influence their relation to attrition during AIT. This is particularly true of variables about behavior during high school (e.g., participation in athletics) and those assessed prior to enlistment (e.g., Armed Services Vocational Aptitude Battery [ASVAB] scores). However, several variables did have significant time-varying effects that accounted for a large percentage of improvement in fit beyond the intercept only model. For example, the time-varying effects for Career Management Field (CMF) category and uncertainty about an Army career accounted for nearly all of the improved fit relative to their associated fixed effects. Keep in mind that while the time-varying effects of several of the fixed effect variables contributed notably to fit (e.g., 80% for Time for Personal Life), the predictiveness of such variables did not vary significantly over time (and thus the time-varying effects should not be interpreted).

Table 5.6 presents the *c* statistics for these predictors by month of AIT. A somewhat surprising result was that in general, the fit of nine time-varying variables increased over the first five months of AIT. For example, the *c* for CMF category was .523 in month 1 and .656 in month 5, and the *c* for AIM Adjustment was .520 in month 1 and .790 in month 5. One possible explanation for this result is that there is something about the relatively small number of MOS that require more than three months of AIT (see Appendix A). We should also note that only 50 Soldiers attrited during the fifth month of AIT. Taken together, these results should be interpreted cautiously.

Multivariate models. Next, we wanted to identify a set of variables that provided optimal prediction of AIT attrition. We began by identifying pre-training variables that theory and previous research (e.g., Griffeth, Hom, & Gaertner, 2000) suggest are related to withdrawal behaviors such as attrition. We identified five main categories of variables available in the SRS and administrative files. The first category included 10 attitudinal variables from the SRS that have been shown to predict attrition, including generalized self efficacy, affective commitment, and perceived stress. Also included were variables that measure behavioral intentions, such as attrition cognitions and Army career intentions. The second category included 16 physical- and medical-related variables, including athletics during high school, likelihood of attrition for physical reasons, and physical extremities-related medical failure. The third category included eight variables related to current or past deviant behavior, such as getting into trouble in high school, drinking before entering the Delayed Entry Program (DEP), and requiring a moral waiver to enter the Army. The fourth category consisted of five variables related to past withdrawal behavior, such as reasons for leaving past jobs and education tier. The final category comprised scores from over 20 cognitive ability tests administered to prospective recruits during the selection process (e.g., Armed Forces Qualification Test [AFQT] category, ASVAB composite scores). Given the high correlations between many of these scales, we analyzed the cognitive variables separately before including them in the overall model. This analysis revealed that only four of these variables contributed to model fit.

Table 5.6. c Statistics for Pre-Training Variables with Time-Varying and Fixed Effects by Month of AIT

Variable	M_c	SD_c	c by Month 1st	2nd	3rd	4th	5th
Time-Varying							
CMF Category	.534	.050	.523	.531	.541	.596	.656
Uncertainty about Army career (54a)	.516	.032	.500	.512	.589	.542	.517
AIM Work Orientation	.549	.022	.532	.569	.551	.597	.575
AIM Adjustment	.556	.093	.520	.591	.573	.575	.790
Required a medical waiver (40)	.517	.022	.515	.516	.509	.535	.568
AFQT Category	.534	.028	.535	.522	.534	.565	.600
SRS Attrition Cognitions	.561	.038	.568	.560	.528	.535	.635
Likelihood of attrition for physical reasons (57a)	.564	.021	.570	.565	.551	.523	.586
Required a moral waiver (39)	.512	.029	.513	.502	.512	.519	.582
Fixed							
Military vs. Civilian Life - Time for Personal Life	.512	.015	.516	.497	.525	.509	.540
Number of Dependents (at entry)	.512	.019	.507	.519	.498	.552	.506
Possible Reasons for Leaving Army - Discrimination	.511	.016	.505	.506	.549	.522	.517
BMI category	.516	.011	.521	.519	.489	.512	.508
Joined Army to make it a career (1u)	.513	.018	.516	.505	.501	.544	.542
Required a physical waiver	.507	.014	.507	.513	.498	.486	.527
Medical failure - physical extremities	.505	.008	.503	.511	.506	.493	.489
Drinking before entering DEP (43)	.519	.028	.509	.527	.521	.580	.500
ASVAB Word Knowledge	.521	.020	.508	.538	.526	.532	.569
Ethnicity	.539	.012	.538	.550	.528	.524	.516
Likelihood of attrition for medical reasons (57g)	.530	.021	.530	.532	.504	.555	.565
Education Tier	.524	.010	.518	.534	.534	.508	.530
Level of stress, strain, or conflict (58)	.557	.056	.564	.561	.521	.591	.430
Time in DEP	.562	.015	.550	.587	.546	.565	.573
Marital Status (at reception)	.543	.013	.535	.560	.536	.554	.524
Participated in athletics during high school (26a)	.584	.029	.578	.580	.636	.570	.547
Never thought about quitting HS (25a)	.561	.043	.563	.545	.566	.576	.668
Gender	.569	.018	.561	.567	.592	.610	.569
Average fitness level before Army (35)	.578	.050	.588	.572	.590	.540	.455
Smoking before DEP (42)	.546	.009	.536	.555	.560	.557	.562

Note. M_c = mean *c* across the first five months of AIT weighted by the number of attrits in each month. SD_c = standard deviation of *c* across the first five months of AIT. Variables are in the same order as in Table 5.5.

The initial model comprised 43 variables across the five predictor categories described above. Before fitting this model, we examined the intercorrelation matrix to identify potential collinearity issues, but none were found. We then fitted the initial model and found that several variables had nonsignificant ($p > .05$) beta weights. These variables were eliminated from the model. Next, stepwise logistic regression was used to identify items that could be removed without harming model fit. This resulted in a model in which all variables were significant and

contributed to fit. As a final step, we generated residuals for this model and correlated them with excluded SRS variables to identify those that might increment fit, but none did. The final model included 17 variables, at least two from each predictor category. One somewhat surprising result was that Generalized Self Efficacy, which had one of the highest bivariate correlations with overall attrition, did not contribute to model fit. A closer look at the data indicated that the contribution of self efficacy diminished when physical-related variables were added to the model.

We then added the remaining admin variables to the model and examined the statistical significance and contribution of the included variables. The final model consisted of 20 variables – 15 from the theory-based model (SRS Career Intentions and fitness before entering Army dropped out) and five administrative variables not included in the initial model (gender, ethnicity, number of dependents, CMF category, and time in DEP). Table 5.7 shows the composition of this model and the performance and medical attrition models (to be discussed later). Table 5.8 displays the odds ratios (ORs) for the model variables. In general, the effects associated with these variables were rather modest. There were, however, a few exceptions. For example, Soldiers with a Tier 3 level of education were over twice as likely to attrit than Tier 1 Soldiers (OR = 2.11). Soldiers with lower AFQT scores were also more likely to attrit than those with higher scores. For instance, Category IV-V Soldiers were over four times more likely to attrit than Category I Soldiers (OR = 4.29). In addition, Soldiers who had physical extremities medical failures were more likely to attrit than those who did not (OR = 1.93). The changes in log likelihood statistics for each model variable are also shown in Table 5.8. The likelihood statistics index the extent to which fit would decrease if a given variable were removed from the model. Given this, gender, athletics during high school, and AFQT category appeared to contribute most to the prediction of overall attrition.

The fit, validity, and utility statistics for the model can be found in Table 5.9 (along with the statistics for subsequent models). We fitted a full model of all available survey and admin data. For comparison, we also fitted a model that included only admin variables (i.e., Admin Only) and a model of the single variable with the highest zero-order correlation with attrition. The full and admin models were developed to optimize the prediction of attrition with the most parsimonious set of variables. All models were fitted to data from the same set of Soldiers.

For overall attrition, the full model of pre-training variables fit the data better than the admin only model, but the latter model was more parsimonious. The admin model, in turn, fit better than the model that included the best single predictor of overall AIT attrition, AIM Physical Condition. The *c* of .711 for the overall model indicates that stayers would be expected to score higher than attritees on this set of variables about 71% of the time. Although pre-training data provided only modest prediction of AIT attrition, using model variables for selection or interventions during training would appear to have some utility for reducing attrition. For example, as Table 5.9 shows, the attrition rate in the upper 5% of the score distribution for the full pre-training model (18.22%) is nearly 3.5 times the base rate for the entire sample (5.34%). .

Table 5.7. Composition of Pre-Training Regression Models for Predicting AIT Attrition

Variable	Type of Attrition		
	Overall	Performance	Medical
Administrative Data			
AFQT category	X	X	X
ASVAB Word Knowledge	X	X	
BMI category	X		
CMF category	X		X
Education tier	X	X	X
Ethnicity	X		X
Gender	X	X	X
Marital status (at reception)	X	X	X
Medical failure - physical extremities	X		X
Number of dependents (at entry)		X	
Required a physical waiver			X
Time in DEP	X	X	X
SRS Single Items			
Joined Army to make it a career (1u)			X
Never thought about quitting high school (25a)	X		
Participated in athletics during high school (26a)	X	X	X
Fitness level before Army (35)		X	
Serious physical injuries before Army (36)			X
Required a moral waiver (39)			X
Smoking before DEP (42)	X		
Drinking before DEP (43)	X	X	X
Uncertainty about Army career (54a)	X	X	
Likelihood of attrition for physical reasons (57a)	X	X	X
Likelihood of attrition for medical reasons (57g)	X		X
Level of strain, conflict, or stress (58)	X	X	
SRS Composites			
Attrition Cognitions	X	X	X
Possible Reasons for Leaving Army - Discrimination	X		X
Total	20	14	18

Note. Survey item numbers are in parentheses.

Performance versus Medical Attrition

We were also interested in whether the pre-training data variables differentially predicted performance attrition and medical attrition, the two main types of AIT attrition. Below, we describe the bivariate relations and multivariate models developed to predict each type of attrition.

Table 5.8. Odds Ratios and Changes in Log Likelihood Statistics for Pre-Training Regression Model Variables

	Type of Attrition					
	Overall		Performance		Medical	
Variable	OR	Δ-2 LL	OR	Δ-2 LL	OR	Δ-2 LL
Administrative Data						
Gender (males)	1.84**	44.86	1.65**	19.07	1.47*	6.21
Education Tier (Tier 1)		8.39		14.04		8.26
Tier 2	1.34*		1.72**		1.24	
Tier 3	2.11		1.07		4.65**	
Ethnicity (White)		8.86				15.80
Black	0.80*				0.70*	
Hispanic	0.71*				0.41**	
Other	0.99				0.59	
Marital status at reception (married)	0.78**	9.24	0.70**	8.09	0.67**	9.12
Number of dependents (at entry)			0.74**	20.88		
AFQT Category (Cat I)		31.25		23.37		13.14
II	1.91*		1.62		4.23*	
IIIa	2.42**		2.24*		4.74*	
IIIb	3.37**		2.93**		5.92*	
IV-V	4.29**		6.20**		3.09	
BMI Category (Normal)		11.66				
Underweight	0.85					
Overweight	1.28**					
Obese	1.30					
Medical Failure - physical extremities	1.93**	10.71			1.97*	5.09
Required a moral waiver					0.42*	7.59
Required a physical waiver					1.81**	6.48
Time in DEP	0.86**	14.22	0.88*	6.18	0.79**	13.67
ASVAB Word Knowledge	1.29**	22.66	1.37**	20.71		

Table 5.8 (Continued)

	Type of Attrition					
	Overall		Performance		Medical	
Variable	OR	Δ-2 LL	OR	Δ-2 LL	OR	Δ-2 LL
Career Management Field (Admin)		19.08				17.51
Intel	0.79				1.00	
Combat Ops	1.12				1.15	
Logistics	0.94				1.05	
Civil/Public Affairs	1.98*				3.65**	
Communications	1.42**				1.97**	
SRS Single Items						
Join Army to make it a career (1u)					1.06**	9.14
Never thought about quitting high school (25a)	0.80*	5.88				
Participated in athletics during HS (26a)	0.77**	42.54	0.69**	25.53	0.77**	13.37
Average fitness level before Army (35)			0.85**	9.14		
Serious physical injuries before Army (36)					1.19**	8.21
Smoking before DEP (42)	1.11*	6.51	0.90*	4.14	0.90	3.57
Drinking before DEP (43)	0.87**	12.96				
Uncertainty about Army career (54a)	1.35**	14.91	1.50**	15.49		
Likelihood of attrition for physical reasons (57a)	1.43**	16.01	1.29*	4.43	1.74**	14.53
Likelihood of attrition for medical reasons (57g)	1.32**	8.46			1.46*	6.14
Level of stress, strain, or conflict (58)	1.12*	6.32	1.21**	11.02		
SRS Composites						
Attrition Cognitions	1.21**	23.92	1.19**	11.82	1.35**	22.35
Possible Reasons for Leaving Army - Discrimination	0.85**	13.39			0.59**	14.02

Note. OR = odds ratio. Standardized ORs are reported for continuous variables. Δ-2 LL = change in -2 log likelihood when the given predictor is removed from the model. The reference category for each categorical variable is in parentheses. ORs less than 1.0 indicate that the given group was less likely to attrit than the reference group, whereas ORs greater 1.0 indicate that the given group was more likely to attrit than the reference group. *β associated with the odds ratio was significant ($p < .05$). **$p < .01$. Statistics are reported only for variables that contributed to the given model.

Table 5.9. Fit, Validity, and Utility Estimates for AIT Attrition Models

Model	*k*	*c*	95% CI_c Lower	95% CI_c Upper	*r*	*r**	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate
Pre-Training Models										
Overall Attrition										5.34
Full Model	20	.711	.639	.729	.18	.30	18.22	15.27	13.51	
Admin Only	12	.656	.637	.674	.13	.22	14.61	12.72	11.74	
Best Predictor (AIM Physical Condition)	1	.594	.569	.620	.09	.14				
Performance-related Attrition										2.86
Full Model	14	.707	.682	.730	.14	.28	10.08	8.20	7.37	
Admin Only	7	.646	.621	.671	.09	.18	9.01	7.35	6.80	
Best Predictor (AIM Physical Condition)	1	.623	.588	.658	.09	.17				
Medical-related Attrition										1.73
Full Model	18	.753	.727	.782	.15	.36	8.00	6.20	5.49	
Admin Only	9	.680	.650	.711	.10	.24	4.35	4.17	3.83	
Best Predictor (SRS Generalized Self Efficacy)	1	.581	.545	.617	.06	.14				
Post-Training Models										
Overall Attrition										1.93
Full Model	10	.762	.736	.789	.24	.56	12.92	8.59	6.95	
Admin Only	9	.651	.624	.678	.08	.18	5.10	3.79	3.38	
Best Predictor (EOTS Generalized Self Efficacy)	1	.685	.656	.714	.17	.40				
Combined Pre- and Post-Training Models										
Overall Attrition										1.92
Full Model	17	.818	.787	.849	.26	.61	13.65	9.45	7.34	
Admin Only	8	.675	.641	.709	.09	.20	4.27	3.47	3.73	
Best Predictor (EOTS Generalized Self Efficacy)	1	.690	.650	.731	.16	.38				

Note. k = number of model variables. c = area under the curve statistic. 95% CI_c = 95% confidence interval of c statistic. Lower = lower bound of CI. Upper = upper bound of CI. r = zero-order correlation between attrition and the predicted probability of attrition based on the model. r^* = adjusted zero-order correlation. All c and r statistics were significant ($p < .05$). Attrition rates are not presented for the Best Predictor variables because there were not enough values to create the necessary percentiles. Base rate = base rate of attrition among Soldiers on which the model is based.

Bivariate relationships. Table 5.10 shows how the validity of individual predictors varied by attrition criterion. Shown are the adjusted correlations (Kemery, Dunlap, & Griffeth, 1988) between variables that correlated with at least one type of attrition +/-.07 or greater (in descending magnitude by validity with overall attrition). Adjusted correlations are reported to control for differences in base rates across attrition categories. Given that performance-related attrition accounted for over half of all AIT attrition, it is not surprising that the pattern and magnitude of correlations was similar to that of overall attrition. However, some differences emerged between performance and medical attrition. For instance, several of the medical-related variables (e.g., medical waiver, serious injuries before Army) were somewhat more predictive of medical attrition, whereas gender and several AIM scales (e.g., Adjustment) were more predictive of performance attrition.

Tables 5.11 and 5.12 present the zero-order validity coefficients and *c* statistics for variables that had correlations of +/-.05 and higher with performance and medical attrition, respectively. The magnitude of the validities and *c* statistics are similar to those for overall attrition (see Table 5.4). AIM Physical Condition was the best predictor of performance attrition, followed by gender, athletics during high school, fitness level before Army, and SRS Generalized Self Efficacy. As for medical attrition, likelihood of attrition for physical reasons, SRS Self Efficacy, and SRS Attrition Cognitions were the only variables that correlated with attrition above .04. Note that the somewhat more modest validity coefficients for medical attrition are likely due to the smaller base rate relative to performance attrition (i.e., 1.83% vs. 3.02%).

Multivariate models. We then developed multivariate prediction models for performance and medical attrition following the same procedure used to create the overall attrition model. The variables comprising these two models can be found in Table 5.7. The composition of these models was quite similar to that of the overall attrition model. Analyses revealed that the medical model demonstrated a better fit to the data than the performance model, although the performance model was more parsimonious (14 vs. 18 variables, see Table 5.9). Both models fit better than the reference admin only models, which fit better than the best single predictor models. However, the admin model predicted performance attrition only slightly better than the best predictor, AIM Physical Condition. In the performance model, athletics during high school, AFQT category, and number of dependents (at entry) contributed most to model fit (based on Δ-2 LL statistics in Table 5.8). CMF category, SRS Attrition Cognitions, and ethnicity contributed most to the medical model.

Post-Training Data Models

We now discuss attrition models developed using survey data collected upon completion of BCT. We followed the same modeling approach as with the pre-training models with the exception that we do not discuss multivariate models of performance and medical attrition. We fitted a performance-related model; however, the composition and fit of the model was almost identical to that of the overall attrition model. Again, this is likely due to the fact that performance attrition accounted for over half (57.0%) of all attrition among Soldiers who completed the EOTS. As for the medical model, a relatively small number of Soldiers who attrited for medical reasons completed the EOTS (n = 79). We did not feel it was appropriate to fit a model based on such a small number of attritees. Taken together, the following section focuses on post-training data models of overall AIT attrition.

Table 5.10. Adjusted Zero-order Correlations between Pre-Training Variables and Overall, Performance, and Medical AIT Attrition

Variable	Type of Attrition		
	Overall	Performance	Medical
Administrative Data			
Gender	.11	.13	.05
Ethnicity	.07	.06	.07
Enlistment waiver	.04	.04	.07
Medical failure - physical extremities	.02	.00	.07
SRS Single Variables			
Participated in athletics during high school (26a)	-.12	-.12	-.09
Likelihood of attrition for physical reasons (57a)	.12	.10	.13
Average fitness level before Army (35)	-.11	-.11	-.10
Never thought about quitting HS (25a)	-.10	-.08	-.07
Time in DEP (5)	-.09	-.07	-.06
Level of strain, conflict, or stress (58)	.08	.09	.06
Smoking before DEP (42)	.08	.06	.07
Advise male about joining Army (52)	-.07	-.06	-.05
Likelihood of attrition for medical reasons (57g)	.05	.04	.08
Required a medical waiver (40)	.04	.02	.08
Serious injuries before Army (36)	.02	.00	.07
AIM and SRS Composites			
AIM Physical Condition	-.13	-.15	-.08
SRS Generalized Self Efficacy	-.11	-.12	-.12
SRS Attrition Cognitions	.10	.10	.12
SRS Thoughts of Quitting High School	.09	.08	.06
AIM Adjustment	-.08	-.10	-.05
AIM Agreeableness	-.06	-.10	-.02
SRS Possible Reasons for Leaving Army - Problems Adjusting	.06	.06	.07

Note. Survey item numbers are in parentheses. Variables within each category appear in descending order by absolute magnitude of *adjusted* correlation with overall attrition. Adjusted correlations with an absolute value of .10 and larger are highlighted.

Bivariate Relationships

Although we did not fit separate models for different types of AIT attrition (for the reasons described above), we did examine differences in bivariate validity coefficients across attrition categories. Table 5.13 displays the bivariate statistics for EOTS single items and composites and Red Phase performance ratings[32] with correlations with overall attrition of +/- .05 and larger. Overall, these correlations were substantially larger than those associated with the pre-training variables (see Table 5.4). The most likely reason for this is that post-training attitudes and beliefs are more proximal to the attrition decision than pre-training attitudes and

[32] Although Red Phase ratings were made during training, we chose to discuss their relation to attrition along with the post-training data.

beliefs. Of the post-training variables, the second Army Physical Fitness Test score (APFT2 Total) had the strongest correlation with attrition (r = -.14). For comparison, the c statistic for this variable (.717) was slightly larger than the c for the 20-variable pre-training data model in predicting overall attrition (.711). EOTS importance of completing enlistment and Generalized Self Efficacy also had notable relations with attrition (both r = -.13). In addition, four variables correlated with attrition +/- .10, including likelihood attrition due to physical reasons, Affective Commitment, Perceived Fit with Army, and APFT1 Total.

Table 5.11. Zero-order Validity Coefficients and c Statistics for Pre-Training Variables Predicting Performance-related AIT Attrition

Variable	*n*	*r*	*c*	SE_c
Administrative Data				
Gender	38,442	.07	.582	.009
Ethnicity	38,442	.03	.543	.008
Pay grade (at entry)	38,442	.03	.536	.008
SRS Single Items				
Participated in athletics during high school (26a)	15,683	-.06	.599	.013
Average fitness level before Army (35)	16,293	-.06	.588	.013
Likelihood of attrition for physical reasons (57a)	15,957	.05	.558	.015
Level of strain, conflict, or stress (58)	16,269	.04	.574	.014
Never thought about quitting high school (25a)	15,971	-.04	.555	.014
Time in DEP (5)	16,132	-.03	.556	.014
Advise male about joining Army (52)	16,192	-.03	.529	.014
Current level of morale (59)	16,282	-.03	.534	.014
Smoking before DEP (42)	16,270	.03	.542	.014
Advise female about joining Army (53)	16,201	-.03	.534	.014
AIM and SRS Composites				
AIM Physical Condition	16,222	-.08	.623	.018
SRS Generalized Self Efficacy	15,974	-.06	.577	.014
AIM Agreeableness	16,256	-.05	.575	.018
AIM Adjustment	16,181	-.05	.574	.018
SRS Attrition Cognitions	15,971	.05	.552	.015
SRS Thoughts of Quitting High School	16,143	.04	.556	.014
AIM Work Orientation	16,000	-.03	.552	.018
SRS Possible Reasons for Leaving Army - Problems Adjusting	16,258	.03	.539	.014
AIM Dependability	16,294	-.03	.544	.018

Note. Survey item numbers are in parentheses. r = zero-order correlation. c = area under the curve statistic. SE_c = standard error of c statistic. All r and c statistics were significant ($p < .05$). Variables within each category appear in descending order by absolute magnitude of correlation with attrition.

Table 5.12. Zero-order Validity Coefficients and c Statistics for Pre-Training Variables Predicting Medical-related AIT Attrition

Variable	*n*	*r*	*c*	SE_c
Administrative Data				
Enlistment waiver	38,210	.03	.530	.012
Medical failure - physical extremities	38,210	.03	.518	.012
Ethnicity	38,210	.03	.557	.011
SRS Single Items				
Likelihood of attrition for physical reasons (57a)	15,775	.05	.580	.018
Average fitness level before Army (35)	16,242	-.04	.584	.017
Required a medical waiver (40)	16,176	.03	.537	.018
Smoking before DEP (42)	16,223	.03	.558	.017
Never thought about quitting high school (25a)	15,924	-.03	.552	.018
Serious injuries before Army (36)	16,258	.03	.543	.018
Time in DEP (5)	16,086	-.03	.559	.018
Level of strain, conflict, or stress (58)	16,221	.03	.556	.018
AIM and SRS Composites				
SRS Generalized Self Efficacy	16,259	-.05	.581	.018
SRS Attrition Cognitions	16,273	.05	.578	.018
AIM Physical Condition	8,149	-.04	.567	.023
SRS Possible Reasons for Leaving Army - Problems Adjusting	16,143	.03	.546	.018

Note. Survey item numbers are in parentheses. r = zero-order correlation. c = area under the curve statistic. SE_c = standard error of c statistic. All r and c statistics were significant ($p < .05$). Variables

Table 5.14 presents the zero-order correlations for the post-training variables that had an adjusted correlation of +/- .15 or higher for at least one type of attrition. Again, the magnitude of these correlations was notably larger than the magnitude of the adjusted pre-training correlations shown in Table 5.10. As with the pre-training variables, there were several expected differences in correlations across types of attrition. For example, medical-related variables (e.g., medical advice against exercise) were more predictive of medical attrition than of performance attrition. In contrast, attitudinal variables (e.g., Perceived Fit) and deviance-related variables (e.g., serious trouble on post) were generally more predictive of performance attrition.

Time-Varying Effects

We then examined the time-varying effects of variables that contributed to one of the post-training prediction models. Unlike the pre-training predictor variables, the fit of most of the post-training predictors varied significantly over time (see Table 5.15). Again, this was expected given that the post-training variables were closer to the attrition event, and thus small changes in time would likely have a more noticeable effect on prediction. Note, however, that the percentage of the change in fit accounted for by the time-varying effects was not very large. With the exception of Job Performance (self-rated), the time-varying effect associated with the post-training variables contributed less than 20% to the increase in fit (the rest being attributable to the fixed effects).

Table 5.13. Zero-Order Validity Coefficients and c Statistics for Post- Basic Training Variables Predicting Overall AIT Attrition

Variable	*n*	*r*	*c*	SE_c
EOTS Single Items				
Importance of completing enlistment (51)	20,915	-.13	.650	.016
Likelihood of attrition for physical reasons (35a)	20,849	.10	.622	.016
Change in commitment during training (9)	20,993	-.09	.641	.016
Self-rated physical fitness (27c)	20,865	-.08	.649	.015
Health now compared to at entry (12)	20,979	-.07	.608	.015
Level of strain, conflict, or stress (36)	20,830	.07	.654	.015
Advise a male about joining Army (40)	20,772	-.06	.576	.016
Medical problems during training (13)	20,986	.06	.611	.014
Advise a female about joining Army (41)	20,736	-.06	.581	.015
Work I enjoy most is available in Army (29)	16,312	-.05	.594	.017
Satisfaction with physical fitness training (25g)	20,886	-.05	.593	.015
Reluctant to leave for more pay (15c)	20,906	-.05	.591	.015
Serious trouble on post (16)	20,799	.05	.526	.015
Satisfaction with peer relationships (25a)	20,983	-.05	.576	.015
EOTS Composites				
Generalized Self Efficacy	20,878	-.13	.685	.015
Affective Commitment	21,004	-.10	.657	.015
Perceived Fit with Army	20,930	-.10	.641	.015
Satisfaction with Army Life	21,024	-.09	.640	.015
Possible Reasons for Leaving Army - Problems Adjusting	20,879	.09	.624	.016
Core Army Values - Loyalty and Selfless Service	20,894	-.08	.613	.015
Core Army Values - Duty, Integrity, and Personal Courage	20,895	-.07	.604	.015
Military vs. Civilian Life - Job Characteristics	20,868	-.06	.602	.015
Satisfaction with Work-Family Balance	21,003	-.06	.600	.016
Job Performance (self-rated)	20,939	-.06	.642	.014
Military vs. Civilian Life - Overall	20,919	-.06	.604	.015
Red Phase Ratings				
APFT2 Total	1,180	-.14	.717	.039
APFT1 Total	1,165	-.10	.647	.039
Fitness Score (APFT2 - APFT1)	1,103	-.09	.611	.053

Note. Survey item numbers are in parentheses. *r* = zero-order correlation. *c* = area under the curve statistic. SE_c = standard error of *c* statistic. All *r* and *c* statistics were significant ($p < .05$). Variables within each category appear in descending order by absolute magnitude of correlation with attrition.

The *c* statistics for the post-training variables can be found in Table 5.16. Again, in contrast to the pre-training predictors, the *c* statistics for all of the post-training variables with significant time-varying effects decreased over time. For example, the *c* for rated importance of completing enlistment (one of the most predictive post-training variables) was .754 in month 1 and .566 in month 5. Also notice that all of the time-varying post-training variables were attitudinal, whereas the four variables with fixed effects were biographical (e.g., marital status, trouble on post).

Table 5.14. Adjusted Zero-order Correlations between Post-Training Variables and Overall, Performance, and Medical AIT Attrition

	Type of Attrition		
Variable	Overall	Performance	Medical
EOTS Single Items			
Importance of completing enlistment (51)	**-.31**	**-.31**	**-.31**
Self-rated physical fitness (27c)	**-.23**	**-.27**	-.17
Likelihood of attrition for physical reasons (35a)	**.23**	**.27**	.14
Change in commitment during training (9)	**-.21**	**-.23**	-.15
Health now compared to at entry (12)	-.18	-.17	-.17
Level of strain, conflict, or stress (36)	-.17	-.17	-.14
Advise male about joining Army (40)	-.15	-.17	-.12
Medical problems during training (13)	.14	.12	.17
Serious trouble on post (16)	.12	.16	.01
Medical advice against exercise (14)	-.08	-.06	-.21
EOTS Composite Variables			
Generalized Self Efficacy	**-.31**	**-.34**	**-.27**
Affective Commitment	**-.24**	**-.26**	**-.20**
Perceived Fit with Army	**-.23**	**-.28**	-.16
Satisfaction with Army Life	**-.21**	**-.23**	-.16
Possible Reasons for Leaving Army - Problems Adjusting	**.20**	**.25**	.09
Importance of Core Army Values - Loyalty & Selfless Svc	-.18	**-.21**	-.14
Satisfaction with Training	-.16	-.17	-.12
Importance of Core Army Values - Duty, Integrity, & Courage	-.16	-.19	-.10
Possible Reasons for Leaving Army - All Reasons	.15	.18	.10
Military vs. Civilian Life - Job Characteristics	-.14	-.16	-.14
Satisfaction with Work-Family Balance	-.14	-.15	-.13
Job Performance (self-rated)	-.14	-.18	-.12
Possible Reasons for Leaving Army - Medical Issues	.10	.10	.18
Red Phase Performance Ratings			
APFT2 Total	**-.27**	**-.24**	**-.32**
APFT1 Total	-.18	-.14	**-.31**
Fitness Score (APFT2 - APFT1)	-.17	-.17	-.09

Note. Survey item numbers are in parentheses. APFT = Army Physical Fitness Test. Variables within each category are in descending order by absolute magnitude of *adjusted* correlation with overall attrition. Adjusted correlations with an absolute value of .20 and larger are highlighted.

Table 5.15. Fit Statistics for Post-Training Variables with Time-Varying and Fixed Effects across the First Five Months of AIT

Variable	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Vary Effect (Step 3)	Δ-2LL (2 vs. 3)	% Step 3
Time-Varying					
Job Performance (self-rated)	4,623	4,542	4,520	22	21.4
Continuance Intentions	4,626	4,566	4,555	11	15.5
Satisfaction with Work-Family Balance	4,625	4,555	4,543	12	14.6
Commitment to Army changed (9)	4,624	4,456	4,429	27	13.8
Advise male about joining Army (40)	4,587	4,516	4,505	11	13.4
Level of stress, strain, or conflict (36)	4,597	4,477	4,465	12	9.1
Affective Commitment	4,625	4,421	4,401	20	8.9
Core Army Values - Loyalty & Selfless Svc	4,621	4,508	4,497	11	8.9
Self-rated physical fitness (27c)	4,600	4,476	4,464	12	8.8
Important to complete enlistment (51)	4,612	4,339	4,316	23	7.8
Satisfaction with Training	4,626	4,505	4,495	10	7.6
Satisfaction with Army Life	4,626	4,459	4,446	13	7.2
Likelihood of attrition for physical reasons (35a)	4,580	4,432	4,421	11	6.9
Perceived Fit with Army	4,592	4,390	4,375	15	6.9
Generalized Self Efficacy	4,620	4,313	4,297	16	5.0
Fixed					
Marital Status (post BCT)	4,625	4,609	4,601	8	33.3
Serious trouble on post (16)	4,590	4,556	4,551	5	12.8
Medical problems during training (13)	4,624	4,548	4,541	7	8.4
Health now compared to at entry (12)	4,605	4,517	4,514	3	3.3

Note. Time-varying predictors are those that differentially predicted attrition across the first five months of AIT, whereas fixed predictors are those whose validity did not vary over time. Δ-2 LL (2 vs. 3) = change in -2 log likelihood when the time-varying effect for the predictor (Step 3) was added to the intercept and fixed effect model (Step 2). % Step 3 = percentage of Δ-2 LL accounted for by the time-varying effect. Predictors within each category are sorted in descending order by % Step 3.

Multivariate Models

We then developed multivariate models for predicting overall attrition using the post-training survey data.[33] We identified 22 survey variables that theory would suggest are related to attrition and that correlated with overall attrition $\geq .05$. Only eight of these variables contributed enough to fit to justify inclusion in the model. We then generated the residuals for this model and correlated them with the excluded survey variables to identify those that might contribute to model prediction. This resulted in two variables (medical problems during training and marital status after BCT) being added to the model.

[33] Fewer than 1,000 Soldiers had both EOTS and Red Phase data, and of those, only 11 attrited during AIT. Thus, we did not incorporate Red Phase ratings in the post-training prediction models.

Table 5.16. c Statistics for Post-Training Variables with Time-Varying and Fixed Effects by Month of AIT

Variable	M_c	SD_c	c by Month 1st	2nd	3rd	4th	5th
Time-Varying							
Job Performance (self-rated)	.661	.073	.714	.627	.591	.544	.500
Continuance Intentions	.642	.055	.666	.647	.594	.513	.567
Satisfaction with Work-Family Balance	.620	.040	.639	.614	.600	.521	.589
Commitment to Army changed (9)	.683	.074	.726	.658	.649	.523	.551
Advise male about joining Army (40)	.605	.045	.637	.572	.590	.539	.503
Level of stress, strain, or conflict (36)	.677	.057	.705	.648	.692	.595	.555
Affective Commitment	.692	.063	.721	.694	.632	.545	.611
Core Army Values - Loyalty & Selfless Svc	.643	.052	.670	.647	.571	.526	.596
Self-rated physical fitness (27c)	.656	.060	.653	.680	.658	.616	.512
Important to complete enlistment (51)	.699	.071	.754	.660	.636	.561	.566
Satisfaction with Training	.646	.052	.673	.637	.617	.528	.561
Satisfaction with Army Life	.664	.067	.678	.676	.648	.529	.537
Likelihood of attrition for physical reasons (35a)	.636	.054	.642	.642	.655	.549	.527
Perceived Fit with Army	.674	.056	.698	.677	.628	.560	.569
Generalized Self Efficacy	.722	.058	.746	.724	.687	.584	.642
Fixed							
Marital Status (post BCT)	.541	.035	.525	.581	.508	.572	.491
Serious trouble on post (16)	.538	.016	.550	.531	.512	.518	.503
Medical problems during training (13)	.632	.033	.663	.604	.601	.567	.582
Health now compared to at entry (12)	.613	.017	.620	.598	.633	.583	.614

Note. M_c = mean *c* weighted by the sample size within each month. SD_c = standard deviation of *c* across the first five months of AIT. Variables are in the same order as in Table 5.15.

The ORs and log likelihood statistics for the 10 variables in the final model are presented in Table 5.17. Most of these variables assessed physical/medical issues and attitudes about the Army. Based on the likelihood statistics, medical problems during training and importance of completing enlistment contributed most to fit. For example, Soldiers who experienced medical problems during training were almost twice as likely to attrit (OR = 1.78) as those who did not experience such problems. Interestingly, several of the variables with the strongest zero-order relations with attrition did not contribute to model fit, including Affective Commitment, Perceived Fit, and Satisfaction with Army Life. This was because these variables shared variance with other, more predictive attitudinal variables in the final model (e.g., Generalized Self Efficacy, perceived stress). As Table 5.9 shows, the post-training data demonstrated a better fit to the data than did the pre-training data (c = .762 vs. .711), and did so with half as many variables (10 vs. 20). As with the pre-training models, the full post-training model fit the data better than did the admin only model (see Table 5.9). The best single predictor, EOTS Generalized Self Efficacy, also fit better than the 9-variable admin model.

Table 5.17. Odds Ratios and Changes in Log Likelihood Statistics for Post-Training Regression Model Variables

Variable	OR	Δ-2 LL
EOTS Single Items		
Change in commitment during training (9)	0.85	7.70
Health now compared to at entry (12)	0.88	9.53
Medical problems during training (13)	1.78	25.55
Serious trouble on post (16)	1.11	9.33
Self-rated physical fitness (27c)	0.82	11.38
Likelihood of attrition for physical reasons (35a)	1.72	16.83
Level of strain, conflict, or stress (36)	0.84	8.00
Importance of completing enlistment (51)	0.79	23.69
Marital status (post BCT)	0.65	15.82
EOTS Composites		
Generalized Self Efficacy	0.82	10.89

Note. OR = odds ratio. Standardized ORs are reported for continuous survey variables. Δ-2 LL = change in -2 log likelihood when the given predictor is removed from the model. All β's associated with the odds ratios were significant ($p < .01$).

Combined Pre- and Post-Training Data Models

We were also interested in assessing the joint use of pre- and post-training data in predicting attrition from AIT. Because post-BCT attitudes and beliefs were more proximal to attrition decisions, and based on the results of earlier models, it is likely that post-training variables will contribute most to the prediction of attrition. However, we wanted to determine whether data collected prior to training would contribute to prediction beyond the post-training information. Unfortunately, we were unable to assess the incremental validity of the pre-training data for predicting performance and medical attrition because so few of the Soldiers who completed both the SRS and EOTS attrited for performance and medical reasons (n = 134 and 43, respectively). Therefore, the models described in this section were developed to predict overall AIT attrition.

We began by reassessing the fit of the pre- and post-training models on the sample of Soldiers who completed both the SRS and EOTS (N = 11,416). The best fitting pre-training model was fairly similar to the one developed on the full sample of Soldiers with SRS data. However, the new model was slightly more parsimonious (17 vs. 20 variables) and fit the data somewhat better (c = .734 vs. .713). The best fitting post-training model was also highly similar to the one for the overall EOTS sample. The only difference was that the Military vs. Civilian Life composite contributed to model fit, whereas perceived stress (item 36) did not. In addition, the fit of this 10-variable model was somewhat better than the fit of the original model (c = .774 vs. .762).

To assess the incremental validity of the pre-training data, we entered the post-training model variables in the first block of the logistic regression model and the pre-training variables in the second block. A significant change in chi-square (based on change in degrees of freedom) would provide evidence for the incremental fit of the pre-training model. The analysis revealed that the pre-training model did increment the more proximal post-training information ($\Delta\chi^2$ = 210.90 (9), $p < .001$). The initial combined model comprised 30 variables and had a c statistic of

.828. However, 16 of these variables were eliminated because they had nonsignificant beta weights. All but one of these eliminated variables (EOTS perceived stress) was from the pre-training model. We then generated residuals for the revised model and correlated them with all excluded pre- and post-training variables. The analysis revealed that one pre-training variable (SRS Military vs. Civilian Life - Time for Personal Life) contributed to fit beyond the current model variables.

The final model comprised 17 variables: 3 admin variables, 6 pre-training variables, and 8 post-training variables. Although a relatively large set of variables contributed to this model, it represents a very small percentage of the variables in the research database. It is interesting to note that none of the admin variables emphasized in prior military attrition research (e.g., gender, ethnicity, AFQT category, education tier) contributed to the final model. As Table 5.9 shows, the combined model fit the data somewhat better than the full post-training model (c = .818 vs. .762). The combined full model also fit better than the best-fitting admin model, which did not fit as well as the best individual predictor of overall AIT attrition, EOTS Generalized Self Efficacy. Table 5.18 shows the ORs and log likelihood statistics for the model variables.

Table 5.18. Odds Ratios and Changes in Log Likelihood Statistics for Combined Pre- and Post-Training Regression Model Variables

Variable	OR	Δ-2 LL
Administrative Data		
Marital status (post BCT)	0.69*	5.50
Time in DEP	0.77**	11.43
Required a medical waiver	1.44	2.52
SRS Single Items and Composites		
Athletics during high school (26a)	0.87	2.92
Smoking before DEP (42)	1.30**	11.19
Drinking before DEP (43)	0.78**	8.77
Attrition Cognitions	0.86	3.17
Reasons for Leaving Army - Discrimination	0.82*	4.69
Military vs. Civilian Life - Time for Personal Life	1.21*	5.05
EOTS Single Items and Composites		
Commitment to Army changed (9)	0.83*	5.04
Health now compared to at entry (12)	0.81**	11.30
Medical problems during training (13)	1.77**	12.02
Serious trouble on post (16)	1.14**	8.13
Self-rated physical fitness (27c)	0.83*	4.48
Likelihood of attrition for physical reasons (35a)	2.21**	17.61
Importance of completing enlistment (51)	0.79**	11.32
Generalized Self Efficacy	0.79**	6.91

Note. OR = odds ratio. Standardized odds ratios are reported for continuous variables. Δ-2 LL = change in -2 log likelihood when the given predictor is removed from the model. *β associated with the odds ratio was significant (p < .05). **p < .01.

The likelihood statistics suggests that physical/medical-related variables such as likelihood of attrition due to physical reasons, medical problems during training, and health now compared to at entry contributed most to model fit. For example, Soldiers who indicated that they would likely attrit because of failure to meet Army physical requirements were 2.21 times more likely to attrit than Soldiers who did not think they would have to attrit for physical reasons.

Changes in Attitudes and Attrition

In the next set of analyses, we examined whether changes between pre- and post-training attitudes were related to AIT attrition. To do so, we calculated change scores for the 11 composite variables that appeared in both the SRS and EOTS. Table 5.19 displays the zero-order validity coefficients and *c* statistics for models that consisted of (a) the EOTS main effect, (b) the EOTS-SRS change score, (c) the EOTS and SRS main effects, and (d) the EOTS-SRS interaction term. The table also indicates whether adding the SRS main effect and the EOTS-SRS interaction to the EOTS and the EOTS and SRS main effect models (respectively) resulted in a significant change in fit.

Only minimal differences were found between the validity coefficients for the EOTS main effect models and the validities for the more complex models. In addition, adding the EOTS-SRS interaction term to a model that included the associated main effects significantly incremented fit for only 3 of the 11 composites. However, adding the SRS main effect did significantly improve model fit for eight of the composites. The median c for models that included the EOTS and SRS main effects (.629) was notably larger than the median c for the EOTS only models (.604). Taken together, while pre-training data incremented the fit of the post-training data, changes in Soldiers' attitudes during BCT appeared to have little effect on whether they attrited.

Structural Model of AIT Attrition

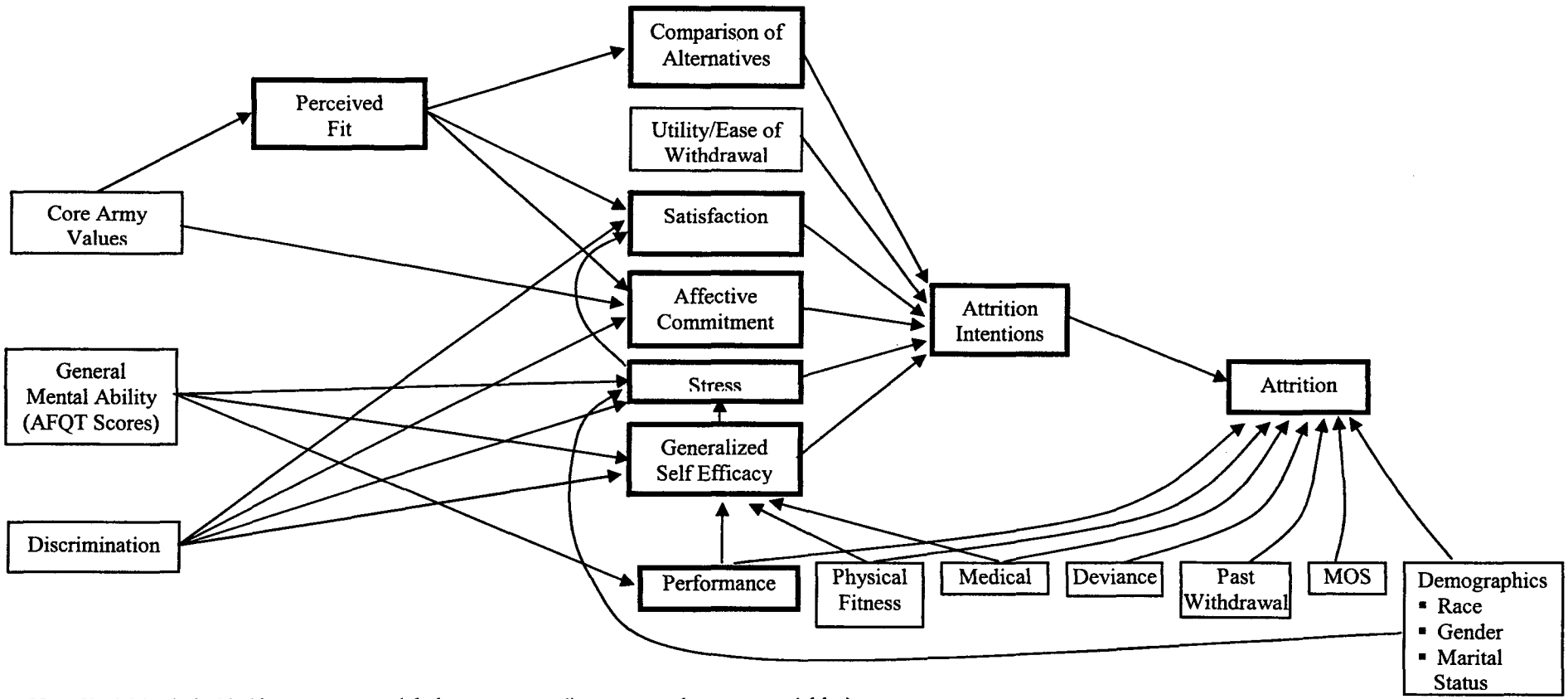
Finally, we developed and assessed a structural model of AIT attrition. As discussed in Chapter 4, the goal of the structural models was to better understand the interrelationships among variables that predict AIT attrition and their antecedents. The preliminary AIT attrition model we created is presented in Figure 5.2. This model was based on findings from prior military attrition research, including results from previous Project First Term research. We also incorporated variables from civilian turnover models (e.g., Hom & Griffeth, 1995) to the extent that they were applicable to attrition in the military.[34] The preliminary model was highly similar to initial structural models presented elsewhere in this report (e.g., see Chapter 7). Perhaps the most notable exception is that we hypothesized that discrimination (e.g., based on gender) would contribute to the model by predicting several antecedents of attrition (e.g., satisfaction, self efficacy).

[34] See Chapter 4 for a detailed discussion of the theoretical rationale for the types of variables in this model.

Table 5.19. Zero-order Validity Coefficients and c Statistics for Pre- and Post-Training Main Effect and Change Score Variables

	EOTS Main Effect		EOTS-SRS Change Score		EOTS and SRS Main Effects			EOTS-SRS Interaction		
Variable	*r*	*c*	*r*	*c*	*r*	*c*	*p*	*r*	*c*	*p*
Affective Commitment	.13	.653	.12	.648	.15	.670	.00	.15	.673	.10
Continuance Intentions	.05	.592	.06	.602	.07	.611	.00	.07	.619	.04
Generalized Self Efficacy	.16	.689	.12	.662	.16	.698	.00	.17	.695	.02
Core Army Values - Duty, Integrity, and Courage	.08	.604	.06	.625	.08	.629	.01	.08	.637	.15
Core Army Values - Loyalty and Selfless Service	.10	.612	.09	.650	.11	.652	.00	.12	.653	.09
Military vs. Civilian Life - Overall	.06	.575	.06	.608	.07	.610	.00	.08	.622	.00
Military vs. Civilian Life - Pay	.03	.551	.04	.564	.04	.563	.00	.04	.570	.42
Military vs. Civilian Life - Time for Personal Life	.02	.558	.03	.577	.03	.585	.01	.04	.598	.19
Possible Reasons for Leaving Army - All Reasons	.06	.667	.05	.644	.06	.676	.07	.06	.676	.58
Possible Reasons for Leaving the Army - Discrimination	.00	.501	.01	.513	.01	.515	.13	.01	.515	.76
Possible Reasons for Leaving the Army - Problems Adjusting	.09	.636	.07	.576	.09	.633	.23	.09	.644	.07
Overall	.06	.604	.06	.608	.07	.629		.08	.637	

Note. Overall = median values across the 11 variables. The *p* value for the EOTS and SRS main effects indexes the change in fit when the SRS variable was added to the model. The *p* for the EOTS-SRS Interaction model assesses the change in fit when the interaction term was added to a model that includes the EOTS and SRS main effects. With the exception of Possible Reasons for Leaving the Army - Discrimination, all *r* and *c* statistics were significant ($p < .05$).



Note. Variables in bolded boxes were modeled as outcomes (i.e., were endogenous variables).

Figure 5.2 Preliminary Structural Model of AIT Attrition

Given the previously discussed sample size and base rate issues, we focused only on overall AIT attrition (i.e., we did not attempt to fit separate structural models for performance and medical attrition). All analyses were conducted within Mplus (Muthen & Muthen, 2001) using the same general modeling strategy described in Chapter 4. That is, we began by fitting the a priori model and proceeded to fit additional models by eliminating nonsignificant paths and/or adding new paths when there was a theoretical and empirical basis for doing so. We continued this process until we achieved a model that (a) had an acceptable fit (based on the criteria available in Mplus), (b) comprised only statistically significant paths, and (c) provided a theoretically meaningful depiction of the causal structures underlying AIT attrition.

The input variables for the structural model were the same as those used in analyses described earlier in the chapter. We did, however, create four new variables to help reduce the complexity of the model. First, we created a variable called Physical Fitness, which was based on a component score (like those described in Appendix H) of two fitness-related items that predicted attrition: EOTS items 27c (self-rated physical fitness) and 35a (likelihood of attrition for physical reasons). Second, we factor analyzed the six EOTS satisfaction scales (i.e., Army Life, Officers, Supervision (2 scales), Training, and Work-Family Balance) and found that they loaded on one main factor that accounted for 50.9% of the variance in responses. Thus, we combined these scales to form an overall composite called Satisfaction. Third, we combined the two military values composites (i.e., Loyalty and Selfless Service and Duty, Integrity, and Courage) to form an overall scale called Core Army Values.

The most notable new variable we created was an "attrition intentions" composite. This variable was developed after a close examination of several conceptually related items that emerged from the logistic regression analyses described earlier. These included EOTS Item 9 (change in commitment during training), Item 51 (importance of completing enlistment), and the items that formed the Generalized Self Efficacy composite (Items 31a-e). Factor analysis of the seven items revealed that Item 31b (confidence in completing enlistment) loaded more strongly with Items 9 and 51 than with the other self efficacy items. Of these, Items 31b and 51 seemed most similar conceptually. That is, these two items appear to measure intentions or attitudes about completing one's enlistment term, whereas Item 9 appears to assesses change in commitment. In fact, eliminating Item 9 increased the internal consistency reliability estimate for these items from .67 to .72. Taken together, we decided to average the ratings of Items 31b and 51 to create the Attrition Intentions composite, which, incidentally, was the most predictive variable of AIT attrition in the database (r = -.15).[35] We also recalculated Generalized Self Efficacy without item 31b.

Most of the variables in the preliminary structural model were assessed in the EOTS. Thus, we began by fitting a model using only the post-training data, which were most proximal to, and as a result, most predictive of AIT attrition. We achieved a good model fit using the post-training data. We then added the pre-training SRS and admin variables that were part of the preliminary model (e.g., Past Withdrawal Propensity, AFQT scores). The fit indices for the preliminary model were very poor (CFI = .26, TLI = .06, RMSEA = .14).[36] With the exception of gender, ethnicity, and months in DEP, adding pre-training variables to the model resulted in notable decreases in fit. Even the pre-training variables included in the previously discussed combined pre- and post-training prediction model (e.g., Attrition Cognitions, athletics in high

[35] The Attrition Intentions composite was coded such that lower scores were associated with higher attrition intentions.
[36] CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root-mean-square error of approximation.

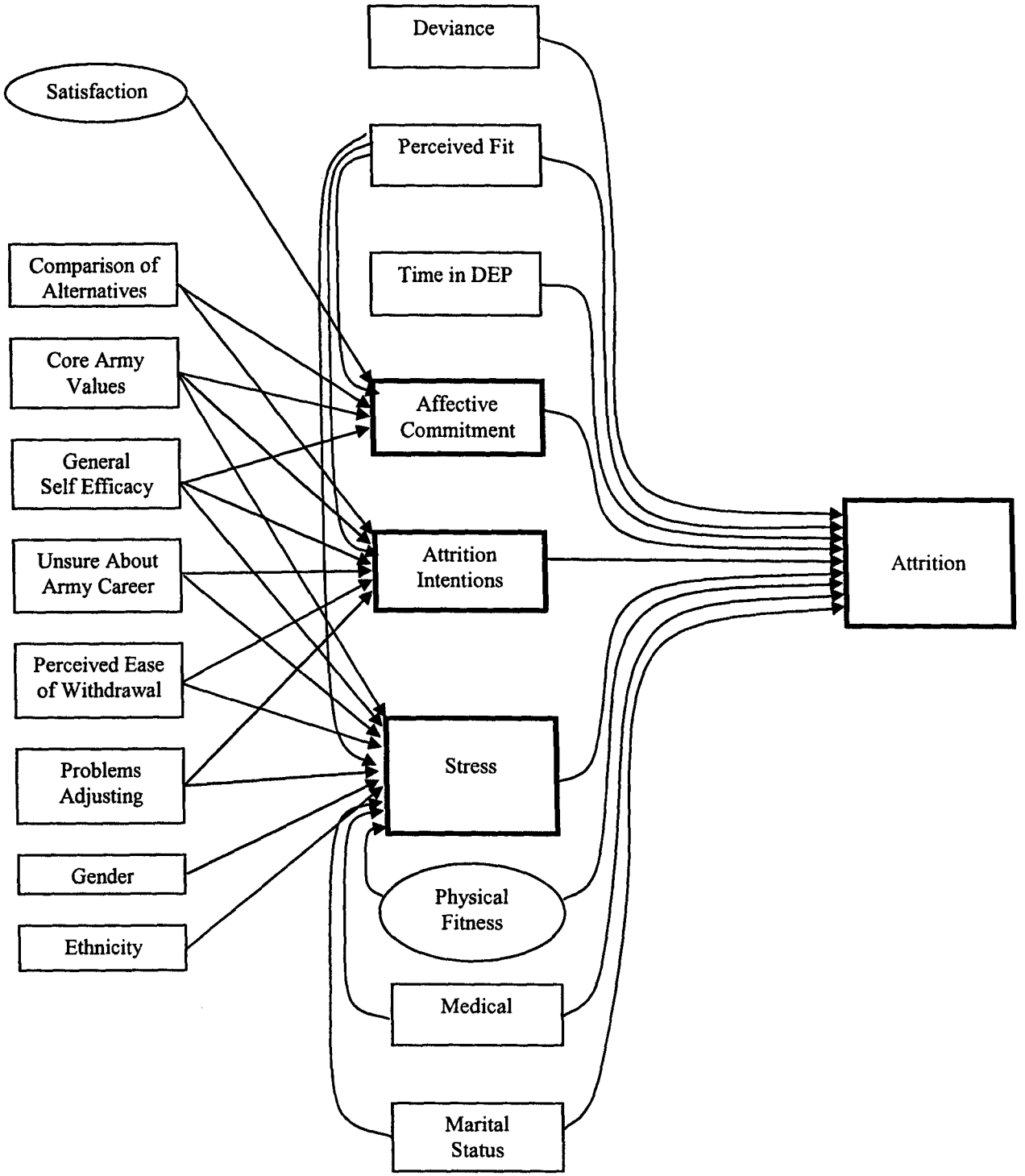
school) did not add to the model. This was not all that surprising given the small relations we observed between the pre-training data and AIT attrition. Thus, the final structural model comprised primarily data collected post-BCT.

The composition of the final model can be found in Figure 5.3. The parameter estimates and Wald statistics for the variables representing each model component are shown in Table 5.20. The model demonstrated a reasonable fit to the data (CFI = .92, TLI = .85, RMSEA = .05), and included most of the hypothesized variables (although the data did not support many of the predicted paths). Nine variables had a direct effect on attrition (R^2 = .18). Five of these variables were hypothesized to directly impact attrition, including Attrition Intentions, Deviance, Physical Fitness, Medical, and Marital Status (post BCT). Three variables we predicted would have an indirect effect on attrition (Perceived Fit, Affective Commitment, and Perceived Stress) actually had a direct effect on attrition. The remaining direct effect, Time in DEP, was not included in the preliminary structural model. Of these variables, Attrition Intentions and Physical Fitness emerged as the most predictive of attrition (based on Wald statistics in Table 5.19).

In addition to attrition, the final structural model included three other endogenous variables: Attrition Intentions, Affective Commitment, and Perceived Stress. Attrition Intentions was predicted by eight variables (R^2 = .62). Three variables, Generalized Self Efficacy, Perceived Fit, and Core Army Values, explained most of the variance in intentions. Five variables contributed to the prediction of Affective Commitment (R^2 = .27), with Perceived Fit explaining the most variance. Finally, 11 variables predicted Perceived Stress (R^2 = .11). Of these, Core Army Values and Physical Fitness contributed most to prediction. We also attempted to identify antecedents of the six other direct predictors of attrition (e.g., Physical Fitness), but the inclusion of such variables decreased model fit. In addition, we were unable to identify theoretically meaningful precursors of the exogenous variables (e.g., Satisfaction) that could be added to the model without harming fit.

We should also note some of the more notable predicted relations that the data did not support. First, discrimination did not affect (either directly or indirectly) AIT attrition. Second, perceived fit and affective commitment influenced attrition directly rather than through other variables such as satisfaction and intentions, as we hypothesized. Third, gender and ethnicity affected attrition through stress rather than having a direct impact on attrition. Lastly, MOS and performance (self-rated) did not contribute to the model.

Given that the structural model comprised mainly post-training variables, we wanted to provide the Army some additional information about pre-training data that could be used to manage AIT attrition. Thus, we identified the pre-training variables that best predicted the variable most related to attrition, Attrition Intentions. Stepwise multiple regression analysis was used to determine the SRS and Army admin variables most related to post-training intentions to attrit. The analysis revealed 10 variables (all from the SRS) that contributed significantly to the prediction of intentions. Table 5.21 displays the regression statistics for these variables, which accounted for 18% of the variance in intentions (adjusted R^2 = .181, p < .001). Attrition Cognitions and Generalized Self Efficacy contributed most to the prediction of intentions (b = -.19 and .13, respectively). Thus, while few (if any) pre-training variables we examined demonstrated sufficient predictive validity to be of practical use to the Army for predicting AIT attrition directly, it appears that pre-training information could be used to forecast attitudes or intentions regarding attrition during AIT.



Note. Variables in bolded boxes were modeled as outcomes (i.e., were endogenous variables). Variables in ovals are component scores based on principal components analyses of the relevant survey variables.

Figure 5.3 Final Structural Model of AIT Attrition

Table 5.20. Parameter Estimates and Wald Statistics for Structural Model of AIT Attrition

Outcome/Predictor	*b*	Wald
Attrition	0.18	
Attrition Intentions	-0.24	-8.27
Physical Fitness	-0.13	-6.03
Deviance (16, serious trouble on post)	0.25	4.91
Medical (13, medical problems during training)	0.22	-4.45
Marital status (post BCT)	0.27	4.42
Affective Commitment	-0.07	-4.07
Perceived Stress (36, level of strain, conflict, or stress)	-0.03	3.55
Time in DEP	-0.13	-3.23
Perceived Fit	-0.12	-2.95
Attrition Intentions	0.62	
Generalized Self Efficacy	0.43	79.40
Perceived Fit	0.60	42.51
Core Army Values	0.20	34.16
Possible Reasons for Leaving Army - Problems Adjusting	-0.11	-28.53
Affective Commitment	0.11	20.36
Comparison of Alternatives (Military vs. Civilian Life)	0.05	16.27
Perceived Ease of Withdrawal (39, difficult to leave Army)	0.02	6.02
Unsure about Army Career	0.02	3.83
Affective Commitment	0.57	
Perceived Fit	0.32	80.67
Satisfaction	0.13	24.17
Generalized Self Efficacy	0.09	21.94
Core Army Values	0.09	17.29
Comparison of Alternatives (Military vs. Civilian Life)	0.07	12.82
Perceived Stress	0.11	
Core Army Values	-0.40	18.71
Physical Fitness	0.95	-18.62
Marital Status (post BCT)	-0.25	-13.09
Possible Reasons for Leaving Army - Problems Adjusting	-0.30	-12.53
Gender	-0.11	-11.88
Race (Black)	0.32	10.58
Race (Hispanic)	0.16	9.24
Race (Other)	0.12	-9.07
Medical (13, medical problems during training)	-0.06	-8.13
Generalized Self Efficacy	0.09	7.87
Perceived Fit	0.28	6.85
Perceived Ease of Withdrawal (39, difficult to leave Army)	-0.14	6.64
Unsure about Army Career	-0.07	4.07

Note. b = regression weight. b for outcome variables is the R^2 for that outcome. For each outcome, predictors are sorted in descending order by absolute magnitude of their Wald statistic. All survey variables are from the EOTS. Survey item numbers are in parentheses. Comparison of Alternatives was measured by the Military versus Civilian - Overall composite. All Wald statistics are significant ($p < .01$).

Table 5.21. Statistics for Variables in Regression Model of Post-Training Attrition Intentions

Variables	*r*	β	Std. Error	*b*
Attrition Cognitions	-.39	-0.18	0.01	-0.19
Generalized Self Efficacy	.35	0.12	0.01	0.13
Affective Commitment	.30	0.04	0.01	0.04
Possible Reasons for Leaving Army - Problems Adjusting	-.26	-0.07	0.03	-0.03
Current level of morale (59)	.22	0.02	0.01	0.03
Continuance Intentions	.22	0.02	0.00	0.04
Join Army because I desire to serve my country (1c)	.19	0.03	0.01	0.05
Possible Reasons for Leaving Army - Deviance	-.16	-0.21	0.04	-0.05
Reasons for Joining Army - Training and Experience	.14	0.02	0.01	0.03
Participated in Athletic teams (26a)	.10	0.04	0.01	0.04

Note. Listwise n = 10,799. All variables are from the SRS. Survey item numbers are in parentheses. β = unstandardized regression coefficient. Std. Error = standard error. b = standardized regression coefficient. All correlations regression coefficients are significant ($p < .01$).

SUMMARY OF MAIN FINDINGS

Below is a summary of the results associated with the research questions examined in this chapter.

1. What is the nature of AIT attrition?

The first and most basic research question concerned the nature of AIT attrition. We were interested in knowing how many Soldiers within this sample attrited during AIT, when they attrited, and why they attrited. The AIT attrition rate for the FY99 cohort was about 6%, which represents about 10% of all first-term attrition. One-half of the Soldiers who attrited did so within the first month of AIT, and about 80% attrited within the first two months of AIT. The majority of those who attrited did so for one of two reasons: entry-level performance and conduct (55%) or medically unqualified for active duty (29%).

2. What pre-training variables best predict AIT attrition?

Overall, modest relations were found between variables measured prior to training and AIT attrition. In fact, none of the bivariate correlations between the pre-training variables and attrition exceeded .09. Three of the five survey variables with the highest zero-order correlations with attrition measured physical-related factors. In terms of multivariate prediction, AIT attrition was best predicted by a set of 20 variables from the SRS and Army admin files. This model included variables that assessed a variety of factors, including physical fitness, attitudes, cognitive ability, demographics, deviance, and past withdrawal behaviors.

The overall pattern of results from the pre-training analyses indicated that Soldiers who (a) were male, (b) believed they are physically fit, (c) were confident in their ability to succeed in the Army (generalized self efficacy), and (d) believed they would complete their enlistment obligation (attrition cognitions) were less likely to attrit during AIT. These findings are in line

with prior research evidence. For instance, other recent military studies have also found that women and Soldiers who are less physically fit are more likely to attrit (e.g., Aldridge, Sturdivant, Sith, Lago, & Maxfield, 1997; Booth-Kewley, Larson, & Ryan, 2002; Demirel, 2002; Knox, 1998; Talcott, Haddock, Klesges, Lando, & Fiedler, 1999). The finding that self efficacy is related to attrition is consistent with results from the civilian turnover literature (e.g., Schaubroeck, Lam, &, Xie, 2000; Wolfe, Nordstrom, & Williams, 1998; Zellars, Hochwarter, Perrewe, Miles, & Kiewitz, 2001). Lastly, the fact that behavioral intentions are related to attrition is also consistent with civilian research showing that intentions to leave are the best predictor of actual turnover (Griffeth et al., 2000).

We also examined whether the pre-training data were differentially predictive of performance and medical attrition, the two main reasons why Soldiers attrit during AIT. As expected, variables related to physical or medical problems before and during training were, in general, more predictive of medical attrition than of performance attrition. In contrast, gender and certain personality variables (assessed by the AIM) were more predictive of performance attrition. The finding that personality was related to attrition is consistent with results of turnover studies within the applied psychology literature (e.g., Barrick & Mount, 1996; Cortina, Doherty, Schmitt, Kaufman, & Smith, 1992; Salgado, 2002).

3. What post-BCT variables best predict AIT attrition?

Relations between attrition and data collected upon completion of BCT (via the EOTS) were also quite modest. However, post-training variables, which were more proximal to the attrition event, were generally more predictive than the pre-training variables. The effects of time lag on predictor-attrition relations were somewhat surprising given the relatively short intervals between data collections. For example, the time between when Soldiers completed the SRS (at reception) and attrition from AIT could have been as little as two months and only as long as about eight months. Further, the SRS and EOTS were administered only 2-3 months apart, which proved to have a rather dramatic affect on the prediction of AIT attrition.

The types of post-training variables that emerged as the best predictors of AIT attrition were similar to those that emerged within the pre-training data. These variables were final Red Phase APFT scores, Generalized Self Efficacy, and rated importance of completing the enlistment term. Subsequent analyses revealed that an "attrition intentions" composite (which comprised the above importance item and the confidence in completing enlistment item from the Generalized Self Efficacy scale) was the single best predictor of AIT attrition ($r = -.15$). This is consistent with prior theory and research (e.g., Fishbein & Azjen, 1975; Griffeth et al., 2000) suggesting that intentions to attrit are most predictive of actual attrition behavior. Nonetheless, the effect of intentions was not as strong as the civilian turnover as the literature would indicate. As discussed elsewhere in this report (e.g., Chapter 4), this likely reflects the fact that military attrition is, by definition, involuntary, whereas civilian turnover research has focused mainly on voluntary turnover. For example, intentions-attrition relations are probably attenuated in the Army context because some Soldiers want to remain in the Army but cannot (e.g., because of physical or medical issues), while other Soldiers want to leave but may have a very difficult time doing so given that attriting requires them to break their contract with the Army.

In terms of multivariate prediction, a relatively small set of 10 survey variables contributed to the prediction of overall AIT attrition. The prediction model comprised primarily physical and attitudinal variables. The simplicity of this model (relative to other prediction models described in this report) was not surprising given the homogeneous nature of AIT attrition (i.e., almost all attrition is due to performance and medical reasons). Thus, we did not expect the AIT prediction model to be as complex as, for example, the in-unit models (see Chapter 7). As with the pre-training data, individual survey items that assessed physical and medical issues tended to be more predictive of medical attrition, whereas items that assessed attitudes and deviance were more predictive of performance attrition.

4. Do pre-training data provide incremental validity beyond the more proximal post-training data in predicting AIT attrition?

We were also interested in the joint use of pre- and post-training information for predicting AIT attrition. Although post-training information was more predictive of attrition, several pre-training variables provided incremental validity beyond the more proximal post-training data. These variables tended to be biographical (e.g., participation in athletics during high school, smoking and drinking before DEP) rather than attitudinal, physical, or medical related. Nonetheless, the post-training EOTS variables appeared to contribute most to prediction. As before, many of these variables in the combined pre- and post-training model assessed physical- or medical-related issues. A somewhat surprising finding was that of all the pre-training admin variables we examined, only two (time in DEP and required a medical waiver) contributed to the fit of the final model. For example, gender, which emerged as one of the best pre-training predictors, did not add to the model. Thus, while admin variables such as gender, race, and education tier may predict early attrition (e.g., attrition from BCT), the present results suggest that their impact on attrition fades over time.

5. Does the validity of pre- and post-training predictors of AIT attrition vary over time?

We then looked at whether admin and survey information varied in the extent to which they predicted attrition across the first five months of AIT. As expected, the fit of most of the distal pre-training variables did not vary much over the course of AIT, whereas most of the post-training variables decreased in fit over time (although the time varying effects did not contribute much to prediction beyond the associated fixed effects). Again, the results of these analyses should be carefully interpreted given (a) the relatively short time span on which these results are based (i.e., five months), (b) the small percentage of MOS with training periods longer than 2-3 months, and (c) the small number of Soldiers who attrited in the latter months of AIT.

6. Do changes between pre- and post-training attitudes predict AIT attrition?

Because several composite variables appeared on both the SRS and EOTS, we were able to investigate whether changes in attitudes during AIT were related to attrition. Analyses revealed that neither the change in attitudes from SRS to EOTS nor the interaction between the two provided incremental prediction beyond the main effects. Therefore, it appears that the prediction of attrition depends more on the time lag between predictor and criterion measurement than on changes in predictor values over time. Please note, however, that we were able to

examine this issue with a limited number of composite variables. Given this, we also were able to assess changes in attitudes that may have a greater affect on the prediction of attrition (e.g., attrition intentions).

7. What is the structural model of AIT attrition?

In the final set of analyses, we developed and evaluated structural models to better understand the variables that predict AIT attrition, as well as the antecedents of such variables. The final model included nine direct effects that explained 18% of the variance in attrition. We were also able to model antecedents of three of the nine direct effects, which were attrition intentions, perceived stress, and affective commitment.

With few exceptions, the pre-training variables did not explain variance in attrition (nor variance in the other endogenous model variables) beyond the more proximal post-training data. Therefore, we attempted to determine which pre-training variables best predicted attrition intentions, the variable most related to attrition. Analyses identified 10 survey variables that contributed to the prediction of post-BCT attrition intentions, with pre-training attrition cognitions and generalized self efficacy explaining most of the variance in intentions.

In many ways, the structural model results reinforced what was learned from the multivariate prediction analyses. For example, although attrition intentions contributed most of the prediction of attrition, several other variables had notable direct effects on attrition, including affective commitment, perceived stress, and physical and medical factors. As discussed, the fact that so many variables directly impacted attrition (rather than affecting attrition through intentions) makes sense given the heterogeneous and potentially involuntary nature of military attrition. Although several of these variables would seem to be difficult for the Army to influence (e.g., deviance, medical issues, marital status), others may hold some promise. For example, the DEP could be expanded and physical fitness standards adjusted to better manage attrition. It might also be possible for the Army to influence attitudinal variables such as attrition intentions, affective commitment, and perceived stress. For instance, several of the variables that predicted these outcomes, including generalized self efficacy, problems adjusting, and satisfaction, are factors training instructors could affect by leading and motivating. As an example, instructors could give Soldiers with lower self efficacy assignments for which the likelihood of success is very high to help build their confidence.

CONCLUSIONS

Finally, we note some conclusions based on these results regarding the nature, prediction, and management of AIT attrition. AIT attrition accounts for only about 10% of all first term attrition. Thus, the Army may be better served by concentrating its resources on reducing attrition at other points (e.g., during BCT or in-unit) that comprise a greater percentage of first term attrition. In addition, about 80% of AIT attrition occurs within the first two months of AIT. Therefore, efforts directed toward managing AIT attrition are likely to be most effective when implemented during BCT or very early in AIT. Further, the majority of Soldiers attrit during AIT for performance or medical reasons, and some variables appear to be differentially predictive of each type of attrition. Although there are problems with the current ISC system for classifying

attrition (see Chapter 1), this result provides evidence that AIT attrition is not a simple, unidimensional construct that can be predicted by a single set of variables. Indeed, type of attrition appears to be an important factor to consider in managing AIT attrition.

The findings from this chapter also lead to several important conclusions regarding the prediction of AIT attrition. First, the modest predictor-attrition relations we observed underscore how difficult it can be to determine what types of recruits are most likely to make it through AIT. Thus, the Army may be somewhat limited in what it can do to reduce AIT attrition through its personnel practices. In fact, the small correlations we found between the pre-training variables and attrition suggest that using even the most predictive variables to screen potential recruits would result in a very large number of false-negative selection decisions. In addition, many of the more predictive variables (e.g., attrition intentions, generalized self efficacy) would be very difficult to assess pre-enlistment. Nonetheless, it is important to reiterate that factors other than "true" predictor-attrition relations contributed to the modest relationships reported in this chapter. Factors such as the extremely low base rate of AIT attrition, range restriction due to prior attrition (i.e., during BCT), and the dichotomous nature of the attrition criterion to a certain extent make the results appear less promising than they actually are.

Second, time lag between predictor and criterion measurement appears to be very important for predicting AIT attrition in that the more proximal post-BCT attitudes were notably more predictive than the pre-training information. Even the two to three-month lag between administration of the SRS and EOTS appeared to have notable effects on predicting subsequent attrition (i.e., the more proximal EOTS variables, in general, demonstrated higher predictive validity than the SRS variables). This, coupled with the very modest validity estimates for the pre-training variables, indicates that AIT attrition may be better managed through post-enlistment training and development initiatives than by pre-enlistment screening processes. Given that the vast majority of attrition occurs within the first two months of AIT, data collected upon completion of BCT or at the beginning of AIT could be quite useful for identifying Soldiers at risk for attrition.

Third, of the hundreds of variables we investigated using a variety of analytic approaches, two variables consistently emerged as the strongest direct predictors of AIT attrition. The first variable is physical fitness. It is noteworthy that the effects of physical fitness remained despite the fact that many Soldiers with lower fitness attrited during BCT (see Chapter 4). Data on physical fitness could serve as the basis for a variety of post-enlistment interventions. For instance, the Army could make use of existing fitness data (i.e., APFT scores) to discover Soldiers at risk of attrition for physical or medical reasons. Surveys such as those examined in this report could also be administered at the beginning of AIT to identify Soldiers who doubt their ability to meet Army physical requirements. The second strongest and most consistent precursor of AIT attrition is intentions to attrit. Simply stated, Soldiers who have thoughts or intentions to leave are more likely to attrit than those who do not have these thoughts/intentions. As with physical fitness, information on attrition intentions could guide training interventions. For example, attrition intentions could be assessed at the outset of AIT to identify Soldiers in need of counseling and/or additional attention.

Although physical fitness and attrition intentions appeared to be the best predictors of AIT attrition, neither variable explained a notable portion of variance in attrition. Given this, it would be advisable to consider these and other variables (e.g., generalized self efficacy, perceived stress) that had a direct effect on AIT attrition in combination. For instance, scores on these variables could be used to create "profiles" of Soldiers at risk for attrition that AIT instructors could then use to help guide their leadership activities.

Finally, it is important to note some variables that were not related to AIT attrition. For example, none of the Army administrative variables shown to predict attrition in prior research (e.g., education tier, AFQT category, gender) contributed to the prediction of AIT attrition beyond the post-training information. Further, several Army programs designed to attract potential recruits and/or prepare them for service (e.g., pay, enlistment bonus, youth programs) were unrelated to attrition. Thus, while factors such as mental ability predict performance of first-term Soldiers and factors such as enlistment bonuses attract individuals to the Army, these results suggest that they have a negligible impact on whether Soldiers make it through AIT.

CHAPTER 6: MODELING ONE-STATION UNIT TRAINING ATTRITION

Dan J. Putka

OVERVIEW

This chapter focuses on predicting and understanding attrition during one-station unit training (OSUT). As noted in Chapter 2, OSUT attrition was defined as attrition that occurred among Soldiers in OSUT MOS while they were in initial entry training (IET). Like Chapter 3, we modeled OSUT attrition using pre-training data only. Furthermore, given that AIM data were only available for a limited number of Soldiers in the cohort, AIM variables were not included in any multivariate models examined in this chapter.[37]

The primary questions we address in this chapter are:

1. Does the frequency or composition of OSUT attrition (e.g., medical *v.* performance) vary by month of OSUT? If so, how?
2. What pre-training variables have the strongest bivariate relationships with OSUT attrition?
3. Do bivariate relationships between pre-training variables and OSUT attrition vary by the month of OSUT when attrition occurs? If so, how?
4. How well can we predict OSUT attrition with models that employ multiple pre-training variables?
5. What pre-training variables play the most prominent role in multivariate models of OSUT training attrition?
6. Can we achieve similar levels of prediction with models that exclude variables that cannot be used in a selection context (e.g., gender, race, MOS)?
7. Are the models of OSUT attrition we form better at identifying some types of attritees than others?
8. Can we identify a good-fitting structural model that helps us understand the processes that underlie OSUT attrition?
9. To what extent do predictions from theory-driven structural models of OSUT attrition overlap with predictions resulting from empirically-driven predictive models of OSUT attrition, and further, match their criterion-related validity?

We also explored if and how the relationships between pre-training variables and OSUT attrition alluded to in questions 2 through 9 above depended on the type of attrition examined (e.g., Medical *v.* Performance).

Answering these questions should help provide the Army with a solid understanding of what factors impact OSUT attrition and why, as well as how much promise capitalizing on them might hold for reducing such attrition.

[37] As in earlier chapters, we did examine bivariate relationships between the AIM variables and attrition. Again, AIM variables were excluded from multivariate models due to missing data issues noted in previous chapters.

METHOD

Sample

The OSUT sample examined in this chapter included all Soldiers in the research cohort who were in OSUT MOS (n = 20,179). As documented below, not all of these Soldiers had SRS or AIM data, thus the sample sizes for many of analyses were smaller than this figure.

Data

As noted above, only data gathered prior to training served as predictor data in this chapter. This included (a) demographic and background information from Army administrative records (e.g., gender, education, enlistment waivers), (b) SRS data gathered at reception battalions, and (c) AIM data for a subset of Soldiers gathered as they processed through their reception battalions. In this respect, the predictors considered here are identical to those examined in the chapter on BCT attrition (Chapter 4). However, there are significant distinctions between this chapter and the BCT chapter. Differences include both the group Soldiers examined (Soldiers in OSUT MOS—primarily combat arms) and the period of attrition examined (attrition throughout OSUT—a considerably longer time than BCT). Our focus in Chapter 4 was on all attrition among FY99 cohort Soldiers, regardless of MOS, through only two months of service.

Of the 20,179 Soldiers in the OSUT sample, 10,737 had SRS data, and 6,682 had AIM data. Table 6.1 shows the demographic composition of the primary samples of data examined in this chapter relative to the full FY99 cohort.

The criteria we examined were: (a) overall attrition, (b) Medical attrition, and (c) Performance attrition during OSUT. Recall from Chapter 2 that when investigating different types of attrition in IET, we defined Medical attrition as a discharge characterized by Interservice Separation Code (ISC)16 (Medically Unqualified for Active Duty, Other), and Performance attrition as a discharge characterized by ISC 87 (Entry Level Performance and Character/ Trainee Discharge Program), because these two ISCs accounted for the vast majority of attrition during the training. This restriction affords a clear look at factors that were most predictive of those ISCs.

Additionally, to help us assess where the multivariate prediction models were performing best and worst, we analyzed exit survey data that were available for a small subset of Solders who attrited during OSUT (n = 813).

Analyses

Composition of OSUT Attrition

To examine the distribution of OSUT attrition over time, we constructed a life table (Singer & Willett, 2003). The life table lists (a) the number of Soldiers entering each month of OSUT, (b) the number who attrited during that month, (c) the percentage of Soldiers entering that month who attrited during that month (i.e., the *hazard* or conditional attrition rate for that month of OSUT), and (d) other information (detailed later) that could can help us understand the extent to which attrition occurs across months of OSUT. To examine the composition of OSUT

attrition in terms of type, we calculated the percentage of overall attrition falling into each of the IET attrition categories noted above (i.e., Medical and Performance). Additionally, we report base rates of each type of attrition in the OSUT sample.

Table 6.1. Demographic Composition of OSUT Analysis Samples vs. FY99 Cohort

	FY99 Cohort		Overall OSUT Sample		SRS OSUT Sample		AIM OSUT Sample	
Group	*n*	%	*n*	%	*n*	%	*n*	%
Gender								
Male	51,107	79.9	19,146	94.9	10,154	94.6	6,392	95.7
Female	12,823	20.1	1,033	5.1	583	5.4	290	4.3
Race								
White	38,361	60.0	14,418	71.5	7,751	72.2	4,790	71.7
Black	15,325	24.0	2,633	13.0	1,345	12.5	902	13.5
Hispanic	6,890	10.8	2,141	10.6	1,113	10.4	665	10.0
Other	3,354	5.2	987	4.9	528	4.9	325	4.9
AFQT Category								
I	2,306	3.6	687	3.4	343	3.2	249	3.7
II	18,799	29.4	5,862	29.1	3,138	29.2	1,956	29.3
IIIa	18,247	28.5	5,978	29.6	3,163	29.5	2,060	30.8
IIIb	22,447	35.1	6,815	33.8	3,783	35.2	2,064	30.9
IV-V	2,009	3.1	801	4.0	298	2.8	349	5.2
Education Tier								
1	55,432	86.7	17,180	85.1	9,346	87.0	5,074	75.9
2	7,966	12.5	2,831	14.0	1,298	12.1	1,558	23.3
3	285	0.4	80	0.4	53	0.5	22	0.3
Totals	63,938		20,179		10,737		6,682	

Note. Because demographic data were missing for a small number of Soldiers, subgroup sample sizes do not always sum to the "totals", and percentages do not always sum to 100%. Also note, actual analysis sample sizes may be smaller than the totals listed here due to missing survey data at the item-level.

Bivariate Relationships

As in previous chapters, we calculated a variety of statistics to assess bivariate relationships between the pre-training variables and each OSUT attrition criterion. Specifically, we examined raw correlations, adjusted correlations, and *c*-statistics (as well as odds ratios for select administrative variables). For indexing bivariate relationships between administrative variables and OSUT attrition, we followed procedures outlined in Chapter 3 (i.e., first generating predicted probabilities of OSUT attrition based on each variable, then examining the probabilities' relationships with attrition). Given the large number of variables available, we limited bivariate analyses to: (a) SRS and AIM composite variables, (b) SRS single items that did not appear in composites, and (c) all administrative variables (see Appendix D for a listing of variables examined).

Event History Analyses

Event history analyses (EHA) using discrete-time hazard models were used to assess *if* and *how* each predictor varied in its relationship with attrition across the months of OSUT (Singer & Willett, 2003). The event history analyses conducted here mirror those described in Chapter 3, with the exception that (a) we focused only on months Soldiers were in OSUT, (b) the sample was limited to only OSUT Soldiers, and (c) as described in the results section, the parameterization of time we used for the OSUT EHA models was completely general.

As in previous chapters, we conducted likelihood ratio tests to determine if a predictor's effect on attrition varied across months of OSUT. We examined odds ratios resulting from these analyses to understand how predictors varied across time (when they did). Additionally, we reported c-statistics within each of month of OSUT based on predicted probabilities resulting from each predictor's model. Reporting these c-statistics gave us an indication of how well a predictor discriminated between attritees and stayers in each month of OSUT.

Multivariate Prediction Models of OSUT Attrition

Two of the goals in this chapter were to assess how well models consisting of multiple pre-training variables could predict OSUT attrition, as well as identifying variables that emerged as the strongest predictors in such multivariate models. To achieve this goal we developed a multi-step model-fitting algorithm, based heavily on stepwise logistic regression procedures, to fit the prediction models. This algorithm is fully described in Appendix G, and it is the same one we used for forming the multivariate prediction models of BCT attrition in Chapter 4. As in Chapters 4, we initially included a slightly larger set of variables than those used in the exploration of bivariate relationships. Specifically, we identified SRS composites that we felt were particularly heterogeneous (e.g., SRS Reasons for Potentially Leaving the Army- All) and considered the individual items from those composites as potential predictors. Given the goal in fitting these models was raw prediction, we wanted to give items that contributed to these more heterogeneous composites a chance to enter into the prediction model if they had some predictive variance to offer.

We fitted models for each attrition criterion (i.e., overall, Medical, Performance) separately. A number of statistics were used to evaluate the models' validity and utility for predicting OSUT attrition. To assess model validity we reported point-biserial correlations (raw and adjusted) and *c*-statistics between predicted probabilities resulting from each model, and the given attrition criterion. To evaluate a model's utility for identifying Soldiers who were at particularly greater risk for BCT attrition, we calculated observed attrition rates among the top scoring 5^{th}, 10^{th}, and 15^{th} percent of respondents on the model's composite (i.e., the predicted probabilities of attrition resulting from the model). We compared these numbers to base rates of OSUT attrition for the entire sample to assess the extent to which the model might hold utility for identifying recruits at high-risk of OSUT attrition. As in previous chapters, to assess the relative contribution of each predictor to a model, we examined odds ratios and the decrement in model fit (i.e., change in –2LL) if the given predictor was removed.

As a final step in evaluating the multivariate prediction models, we correlated squared deviance residuals resulting from each model with exit survey data for OSUT attritees in the

samples.[38] Of course, these analyses were conducted only on attritees because they were the only Soldiers who had exit survey data linked to OSUT attrition. Examining correlations between squared deviance residuals and exit survey responses from OSUT attritees allowed us to identify the types of attritees for whom the models fit best (i.e., responses associated with smaller deviance residuals) and worst (i.e., responses associated with larger deviance residuals).

Structural Models of OSUT Attrition

The primary goal of building and fitting structural models of OSUT attrition was to help the Army understand the mechanisms by which the most salient predictors of early attrition (and their antecedents) function. Unlike the empirically-driven prediction models described above, the focus here was on explanation and understanding, rather than pure prediction. Nevertheless, like the structural models of BCT and AIT attrition, ideally the vast majority of variance from the predictive models will be captured in the much smaller set of direct effects on attrition proposed in the structural models. Also like previous chapters, a secondary goal of this modeling effort was to gain a better understanding of how and where traditionally important demographic variables fit into structural models of OSUT attrition.

As in previous chapters, to build and assess structural models of OSUT attrition, we needed a point of departure, specifically, a preliminary structural model around which we could focus our efforts. We felt that the overall structural model of BCT attrition we identified in Chapter 4 (see Figure 4.2) provided a good point of departure for the OSUT structural modeling efforts. We felt the BCT structural model was a good place to begin because: (a) it modeled attrition in the first two months of service for *all* Soldiers (i.e., both OSUT and non-OSUT), and (b) like the OSUT models, it too focused only on pre-training data. Thus, we had reason to believe that the structural model we built for BCT would work well for OSUT attrition as well.

Modeling Strategy

As in previous chapters, we used M*plus* analysis software to fit all of the structural models (Muthen & Muthen, 2001). We assessed the fit of the preliminary structural model of OSUT attrition to the data and assessed the significance of its hypothesized paths. Model fit was assessed using three criteria commonly used in the literature (i.e., CFI, TLI, RMSEA), and the significance of paths was assessed using Wald statistics.

Because the purpose of the structural modeling effort was mainly to be informative to the Army in its effort to understand OSUT attrition, we proceeded to fit additional models to the data, eliminating paths that were non-significant in the preliminary model and adding new paths when both (a) simple modification data suggested it, and (b) it was either theoretically meaningful or informative to do so (e.g., as in the case of understanding the role of demographic variables). We continued this process of refining the preliminary model until we arrived at a final OSUT model that: (a) fit the data well based on commonly used criteria, (b) consisted of only statistically significant paths, and (c) provided what we felt was both a theoretically meaningful and informative depiction of the causal structures underlying OSUT attrition.

[38] A full description of the exit survey data that we examined is presented in Chapter 1.

RESULTS

Composition of OSUT Attrition

Table 6.2 shows the life table for the OSUT attrition sample. The overall attrition rate through four months of OSUT was 8.8%. Soldiers were at greatest risk for OSUT attrition in their second and third months of OSUT (Hazards = .034 and .038, respectively). Indeed, 81.1% of all OSUT attrition occurred between months two and three. Figure 6.1 shows the hazard profile for the overall OSUT sample, and SRS and AIM samples (i.e., OSUT Soldiers who had such types of data). As Figure 6.1 reveals, the hazard for OSUT attrition is highest in months two and three, and notably lower in months one and four.

Table 6.2. OSUT Sample Life Table

Month of OSUT	Total Entering	In-Service	Attrit	Hazard	Cumulative OSUT Attrition Rate	Proportion of All OSUT Attrition	Cumulative Proportion of All OSUT Attrition
1	20,179	19,991	188	.009	.009	.106	.106
2	19,991	19,306	685	.034	.043	.385	.490
3	19,304	18,578	726	.038	.079	.408	.898
4	9,539	9,362	177	.019	.088	.099	.998[a]

Note. Total Entering = Number of Soldiers entering the given month in OSUT. In-Service = Number of Soldiers still in OSUT at the end of the given month in OSUT. Attrit = Number of Soldiers who attrited during the given month in OSUT. Hazard = Proportion of Soldiers that entered the given month in OSUT who separated during that month (i.e., the conditional attrition rate for the given month). Cumulative OSUT Attrition Rate = Proportion of all Soldiers in the sample who separated during or before the given month in OSUT. Proportion of All OSUT Attrition = Proportion of all OSUT attritees who separated during the given month in OSUT. Cumulative Proportion of All OSUT Attrition = Proportion of all OSUT attritees who separated during or before the given month in OSUT.
[a]According to the data, several Soldiers (n = 1,103) were in OSUT beyond 4 months, but very few of these Soldiers attrited (n = 4), as such, we focused the study of OSUT attrition on Soldiers' first four months of OSUT only.

Hazard profiles for the SRS sample varied little from the overall sample. However, the hazard profile for the AIM sample was notably higher than the overall sample in months two and three (Hazards = .049 and .046, respectively). Not surprisingly, these differences in the AIM hazard profile translated into a slightly higher OSUT attrition rate for Soldiers in the AIM sample (11.3%) compared to Soldiers in the overall sample (8.8%) and SRS sample (9.2%).[39]

Next we turned attention to the composition of OSUT attrition by type. Table 6.3 shows the composition of OSUT attrition by month of OSUT. Consistent with findings presented in Chapter 2, we found that Medical and Performance attrition accounted for the vast majority of OSUT attrition (88%). Across the months of OSUT, Medical attrition accounted for notably more attrition than Performance attrition. Across all months of OSUT, Medical attrition accounted for 59.1% of attrition, whereas Performance attrition accounted for 29.1% of attrition. This distribution of Medical versus Performance attrition seems consistent with the physically

[39] The elevated attrition rate in the AIM cohort may be due to oversampling of Tier 2 Soldiers in that cohort (Tier 2 Soldiers tend to have higher attrition rates than Tier 1 Soldiers). At the time the AIM data were collected, the AIM was being considered as screening tool for GED Plus program recruits. When the AIM data were collected, Tier 2 recruits appear to have been oversampled. Specifically, whereas Tier 2 Soldiers comprised 9.5% of the OSUT sample *without* AIM data, they comprised 23.4% of the OSUT sample *with* AIM data.

demanding nature of the Combat Arms MOS that comprise the majority of the OSUT sample. Lastly, the base rate of Medical attrition in OSUT was 5.2%, whereas the base rate of Performance attrition in OSUT was 2.6%.

Table 6.3. Composition of OSUT Attrition by Month of OSUT

				Medical		Performance	
Month of OSUT	Total Entering	In-Service	OSUT Attrit	Attrit	% of OSUT Attrit	Attrit	% of OSUT Attrit
1	20,179	19,991	188	78	41.5	51	27.1
2	19,991	19,306	685	433	63.2	182	26.6
3	19,304	18,578	726	446	61.4	227	31.3
4	9,539	9,362	177	95	53.7	58	32.8
Total			1,780	1,052	59.1	518	29.1

Note. OSUT Attrit = Number of Soldiers who attrited during the given month of OSUT. The number of Soldiers who separated for each type of attrition in a given month of OSUT is noted in the "Attrit" column under each type. The percentage of all Soldiers who separated in a given month of OSUT for each type of attrition is noted in the "%" column under each type.

Bivariate Relationships between Pre-Training Variables and OSUT Attrition

Overall Attrition

Table 6.4 presents correlations and *c*-statistics for administrative variables, single-item SRS variables, and SRS and AIM composites[40]. Only variables that had correlations of .05 or greater in magnitude with attrition are presented. Based on these results, predictor-attrition relations appear modest based on correlations, but recall, such correlations are heavily attenuated for low base rate criteria, and the base rate of OSUT attrition was quite low (8.8%). Review of the *c*-statistics (which are invariant to base rate) indicate that several predictors discriminated reasonably well between attritees and stayers (e.g., at levels 20% beyond chance; $c > .60$).

Somewhat surprisingly, administrative variables generally had weak bivariate relationships with OSUT attrition. Not surprisingly, two of the stronger effects were for gender and education tier. The odds of OSUT attrition for females were 2.13 times greater than the odds of such attrition for males. With regard to education tier, the odds of OSUT attrition for Tier 2 Soldiers were 1.68 times greater than the odds of such attrition for Tier 1 Soldiers. As in earlier chapters, the attrition rates between Tier 1 and Tier 3 Soldiers were not significantly different (again perhaps reflecting that the small number of Tier 3 Soldiers were screened more carefully). With the exception of MOS (discussed below) relationships between other administrative variables and OSUT attrition were generally weak, but in a direction that was consistent with past research (i.e., single, fewer dependents, minority, less likely to attrit; Laurence et al., 1996). Notably absent from the list of top administrative correlates of OSUT attrition was AFQT category.

[40] In this and subsequent tables, refer to the survey booklets in Appendix A for the precise wording of the questions in the various surveys. In each table, we identify the survey and the question/response option number, and provide only a very short extract. The wording of the question stem is often crucial to understanding that extract.

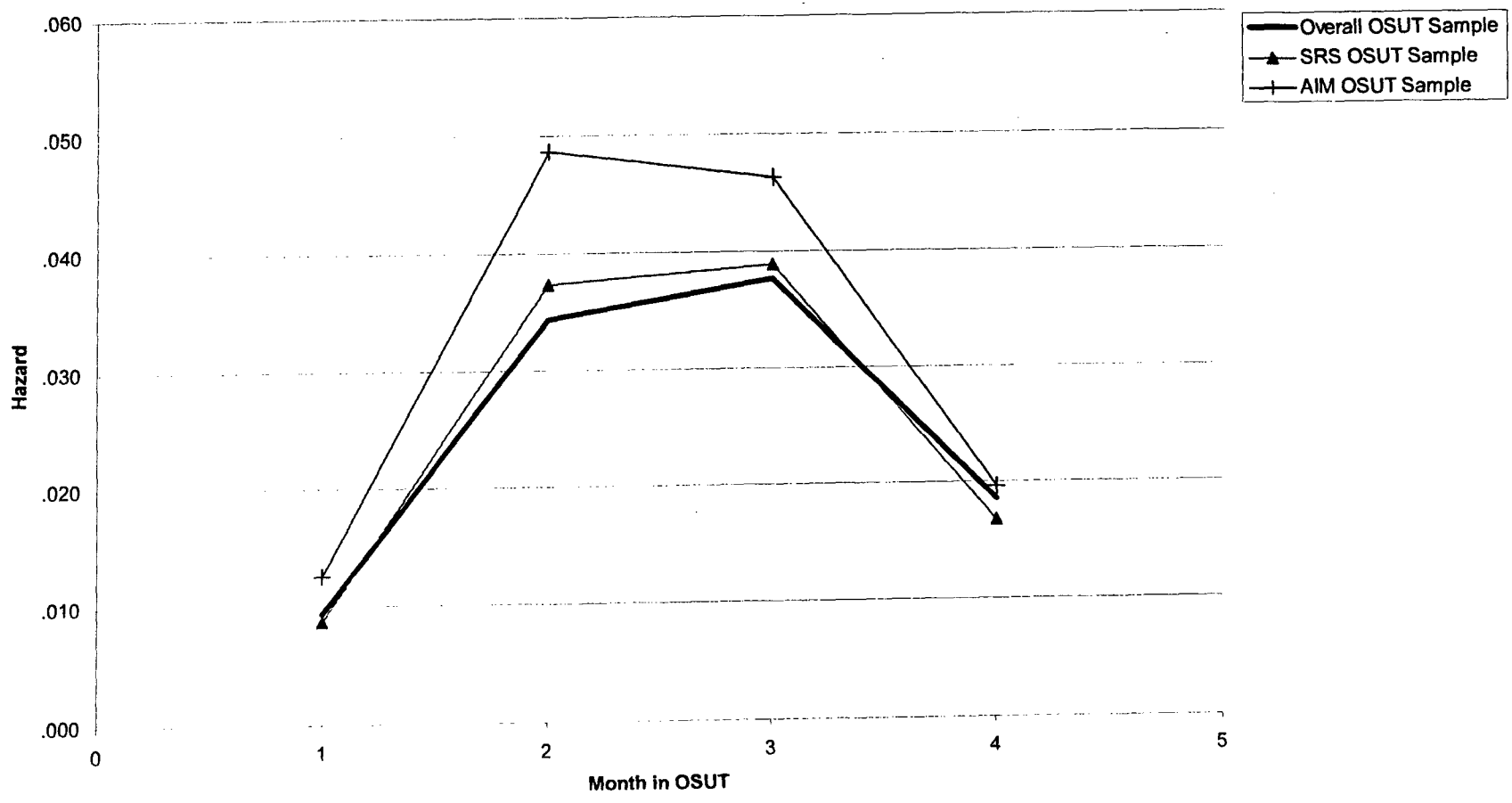


Figure 6.1. Hazard Profile by Month of OSUT and Sample

Table 6.4. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of OSUT Attrition

Predictor	*n*	*r*	*c*	SE_c
Administrative				
OSUT MOS	20,176	.07	.570	.007
Gender	20,176	.06	.524	.007
Education Tier	20,088	.06	.536	.007
Race/Ethnicity	20,176	.06	.545	.007
Marital Status at Entry	20,176	.06	.529	.007
Number of Dependents at Entry	20,176	.05	.529	.007
SRS Single Items				
58. Level of stress/strain	10,713	.11	.606	.010
25a. Never thought about quitting HS	10,543	-.10	.576	.010
52. Advise male about joining Army	10,683	-.09	.549	.010
37. Medical advice against exercise	10,711	.08	.534	.010
05. How long in DEP	10,649	-.08	.577	.009
59. Current level of morale	10,708	-.08	.567	.010
53. Advise female about joining Army	10,677	-.07	.553	.010
47. Work I enjoy most is available	10,694	-.07	.564	.010
35. Average fitness level before Army	10,725	-.06	.559	.010
36. # Serious injuries before Army	10,722	.05	.537	.010
42. How often smoke before DEP	10,705	.05	.541	.010
40. Medical waiver needed to join Army	10,692	.05	.522	.010
SRS and AIM Composites				
SRS Attrition Cognitions	10,735	.18	.629	.010
SRS Generalized Self Efficacy	10,724	-.16	.616	.010
SRS Reasons for Leaving Army - All Reasons	10,724	.12	.609	.010
SRS Reasons for Leaving Army - Problems Adjusting	10,697	.11	.592	.010
AIM: Adjustment	6,667	-.10	.581	.011
AIM: Physical Condition	6,669	-.10	.587	.011
SRS Thoughts of Quitting High School	10,543	.09	.578	.010
SRS Affective Commitment	10,730	-.09	.576	.010
SRS Reasons for Leaving Army - Deviance	10,675	.07	.545	.010
SRS Reasons for Quitting Previous Jobs	10,654	.07	.563	.010
SRS Trouble in School	10,582	.07	.557	.010
AIM: Agreeableness	6,675	-.07	.557	.011
AIM: Dependability	6,668	-.07	.562	.011
SRS Core Army Values - Loyalty, Selfless Service	10,729	-.06	.530	.010
SRS Military vs. Civilian- Quality of Work Life	10,696	-.06	.540	.010
SRS Military vs. Civilian- Overall	10,701	-.06	.550	.010
SRS Reasons for Joining Army - Travel	10,714	-.06	.554	.010
SRS Participation in DEP Activities	10,678	-.05	.541	.010
AIM: Work Orientation	6,668	-.05	.539	.011
SRS Reasons for Joining Army - Personal Growth	10,720	-.05	.543	.010
SRS Military vs. Civilian- Time for Personal Life	10,600	-.05	.558	.010

Note. r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r and c-statistics are significant ($p < .05$, one-tailed). Within each category, predictors are sorted in descending order by magnitude of their correlation with attrition.

Given that many of the OSUT MOS are closed to women, the relationship between MOS and attrition may simply reflect a gender composition effect. To assess this possibility, Table 6.5 provides data on OSUT attrition rates by MOS and gender.

Table 6.5. OSUT Attrition Rates by MOS and Gender

	Male		Female		Overall	
MOS	*n*	% Attrit	*n*	% Attrit	*n*	% Attrit
11B: Infantry	2,917	6.4			2,918	6.5
11C: Indirect Fire Infantry	585	7.0			585	7.0
11H: Heavy Anti-Armor Infantry	357	5.0			357	5.0
11M: Fighting Vehicle Infantry	1,730	8.4			1,730	8.4
11X: Unassigned Infantry	3,042	11.1			3,044	11.1
12B: Combat Engineer	2,488	7.5			2,489	7.6
12C: Bridge Crew Member	165	9.1	43	7.0	208	8.7
13B: Cannon Crew Member	2,212	9.0			2,213	9.0
19D: Cavalry Scout	1,839	9.7			1,840	9.8
19K: M1 Armor Crewman	1,923	6.6			1,924	6.7
54B: Chemical Operations Specialist	583	10.5	371	15.1	954	12.3
95B: Military Police	1,208	8.9	561	17.6	1,769	11.6
95C: Internment/Resettlement Specialist	94	5.3	51	13.7	145	8.3
Totals	19,143	8.4	1,033	16.4	20,176	8.8

Note. *n* = Number of Soldiers in given MOS at entry. % Attrit = Percentage of Soldiers in the given MOS that attrited in OSUT.

Table 6.5 shows that OSUT MOS with the highest rates of attrition were 54B (Chemical Operations Specialist), 95B (Military Police), and 11X (Unassigned Infantry); those MOS with the lowest were 11H (Heavy Anti-Armor Infantry), 11B (Infantry) and 19K (M1 Armor Crewman). In OSUT MOS that were *not* barred to women, attrition rates were notably higher among women than men (exception 12C: Bridge Crewmember). Nevertheless, gender composition effects do not seem to fully account for all the differences in MOS attrition rates we observed. For example, attrition rates among unassigned infantry Soldiers (11X) were much higher than those among infantry Soldiers who were assigned an MOS. These findings may suggest that failing to know one's MOS assignment prior to training might be stressful for a Soldier (i.e., yet another source of uncertainty) and lead to higher rates of attrition. The structural models we examine later inform this possibility.

Several survey variables achieved levels of prediction that exceeded that of the strongest administrative variables. For example, SRS Attrition Cognitions emerged as the strongest correlate of OSUT attrition, having a lackluster correlation of .18 (again reflecting the low base rate issue), but a respectable *c*-statistic of .629. Other survey variables tapping into pre-service attitudes and beliefs also fared reasonably well in predicting OSUT attrition. Notably, both SRS Generalized Self Efficacy and SRS Item 58 (Level of stress/strain) had *c*-statistics over .60. Variables reflecting past withdrawal, core Army values, pre-training fitness, medical condition, pre-service deviant behavior, and Emotional Stability (e.g., SRS Number of Potential Reasons for Leaving- Problems Adjusting, AIM Adjustment) were also represented in the list of top correlates of OSUT attrition.

Comparison of Bivariate Relationships Across Types of Attrition

Given the differences in base rates across different attrition criteria, we focus subsequent discussion of bivariate relationships on adjusted correlations between predictor variables and criteria. For reference, raw correlations between predictor variables and each type of OSUT attrition are presented in Appendix K.

As Table 6.6 shows, several of the top correlates of OSUT attrition appeared to be differentially predictive of Medical and Performance attrition. Among administrative variables, gender, race and MOS appeared to have the largest differences in validity across criteria. For example, gender and race were more predictive of Medical attrition, whereas MOS evidenced a stronger relationship with Performance attrition. Logistic regression analyses revealed the odds of Medical attrition for females were 2.16 times greater than the odds of such attrition for males, whereas the odds of Performance attrition for females were only 1.69 times greater than the odds for males. With regards to race, logistic regression analyses revealed that the odds of Medical attrition for Hispanics and blacks were 2.35 and 1.52 times (respectively) *less* than the odds of such attrition for whites. Conversely, the odds of Performance attrition for Hispanics were only 1.66 times less than the odds of such attrition for whites, and the odds of Performance attrition among blacks and whites were not significantly different.

Table 6.7 shows Medical and Performance attrition rates by MOS. Soldiers in MOS 12B (Combat Engineer) and 19K (M1 Armor Crewman) were at notably lower risk for Performance attrition than Medical attrition. Indeed differences between Medical and Performance attrition rates for Soldiers in these MOS were far greater than the difference in Medical and Performance base rates in the overall OSUT sample. The incidence of Medical and Performance attrition were about the same for Soldiers in assigned infantry MOS (i.e., 11B, 11C, 11H, 11M).

A review of Table 6.6 revealed that a number of survey variables were differentially predictive of Medical and Performance attrition. For example, SRS Item 37 (Medical advice against exercise), SRS Item 36 (Number of serious injuries before Army), SRS Item 40 (Medical waiver needed to joint Army), and SRS Reasons for Quitting Previous Jobs were notably more related to Medical attrition than they were to Performance attrition. Conversely, SRS Item 25a (Never thought about quitting high school), as well as several SRS and AIM composite variables (e.g., SRS Trouble in School, SRS Potential Reasons for Leaving the Army- Problems Adjusting, AIM Agreeableness, Dependability, and Physical Conditioning) were more related to Performance attrition than they were to Medical attrition. With the exception of the medical variables being more related to Medical attrition, such a pattern of findings is quite difficult to explain. For example, SRS Reasons for Quitting Previous Jobs and SRS Thoughts of Quitting High School may both reflect past propensity for withdrawal (see Appendix H) but the Quitting Jobs composite was far more related to Medical attrition (relative to performance) and the Quitting High School composite was far more related to Performance attrition (relative to medical).

Table 6.6. Adjusted Correlations between Different Types of OSUT Attrition and Top Pre-Training Predictors

Predictor	Type of Attrition		
	Overall	Medical	Perform
Administrative			
OSUT MOS	.10	.10	.15
Gender	.09	.08	.05
Education Tier	.08	.06	.09
Race/Ethnicity	.08	.09	.05
Marital Status at Entry	.08	.05	.08
Number of Dependents at Entry	.07	.06	.07
SRS Single Items			
58. Level of stress/strain	.15	.12	.13
25a. Never thought about quitting HS	-.14	-.08	-.16
52. Advise male about joining Army	-.13	-.07	-.12
37. Medical advice against exercise	.12	.14	.04
59. Current level of morale	-.12	-.09	-.11
05. How long in DEP	-.11	-.08	-.09
53. Advise female about joining Army	-.10	-.06	-.08
47. Work I enjoy most is available	-.10	-.08	-.09
35. Average fitness level before Army	-.09	-.07	-.07
36. # Serious injuries before Army	.08	.10	.00
42. How often smoke before DEP	.07	.05	.05
40. Medical waiver needed to join Army	.06	.08	.03
SRS and AIM Composites			
SRS Attrition Cognitions	.26	.20	.21
SRS Generalized Self Efficacy	-.22	-.20	-.14
SRS Reasons for Leaving Army - All Reasons	.16	.11	.14
SRS Reasons for Leaving Army - Problems Adjusting	.16	.09	.17
SRS Thoughts of Quitting High School	.13	.06	.15
AIM: Adjustment	-.13	-.08	-.12
SRS Affective Commitment	-.13	-.08	-.12
AIM: Physical Condition	-.13	-.07	-.14
SRS Reasons for Leaving Army - Deviance	.10	.04	.10
SRS Reasons for Quitting Previous Jobs	.10	.10	.04
SRS Trouble in School	.09	.05	.11
SRS Reasons for Joining Army - Travel	-.09	-.06	-.08
AIM: Agreeableness	-.09	-.04	-.12
AIM: Dependability	-.09	-.04	-.12
SRS Core Army Values - Loyalty, Selfless Service	-.08	-.03	-.09
SRS Military vs. Civilian- Quality of Work Life	-.08	-.05	-.06
SRS Military vs. Civilian- Overall	-.08	-.05	-.07
SRS Participation in DEP Activities	-.07	-.05	-.06
AIM: Work Orientation	-.07	-.03	-.08
SRS Reasons for Joining Army - Personal Growth	-.07	-.05	-.06
SRS Military vs. Civilian- Time for Personal Life	-.07	-.05	-.06

Note. Values in cells are adjusted correlations (Kemery et al., 1988) between the given predictor and the given attrition criterion. They provide an estimate of what the correlation would be if the base rate of attrition were .50. Within each category, predictors are sorted in descending order by magnitude of their correlation with overall OSUT attrition. Correlations are highlighted if their adjusted values are at least .05 in magnitude.

Table 6.7. OSUT Medical and Performance Attrition Rates by MOS

MOS	*n*	% Attrit	
		Medical	Perform
11B: Infantry	2,918	3.1	3.3
11C: Indirect Fire Infantry	585	3.4	3.6
11H: Heavy Anti-Armor Infantry	357	2.2	2.5
11M: Fighting Vehicle Infantry	1,730	4.2	4.0
11X: Unassigned Infantry	3,044	5.8	3.4
12B: Combat Engineer	2,489	6.1	0.7
12C: Bridge Crew Member	208	5.4	2.0
13B: Cannon Crew Member	2,213	5.1	3.3
19D: Cavalry Scout	1,840	6.9	2.1
19K: M1 Armor Crewman	1,924	4.5	0.8
54B: Chemical Operations Specialist	954	7.0	2.8
95B: Military Police	1,769	7.3	2.7
95C: Internment/Resettlement Specialist	145	5.6	1.4
Totals	20,176	5.2	2.6

Note. n = Number of Soldiers in given MOS at entry. % Attrit = Percentage of Soldiers in the given MOS that attrited in OSUT for given type of attrition.

Assessing the Effects of Predictors Across Months of OSUT

Although the analyses above provide insight into the bivariate relationships between pre-training variables and attrition, they do not speak to the stability of those relationships across time. In this section we examine *if* and *how* the relationships observed above change as a function of the month of OSUT when attrition occurs.

Parameterizing Time

To test for potential time-varying effects of each pre-training variable, we constructed discrete-time hazard models. Unlike the examination of attrition across 48 months of service in Chapter 3, here we examined attrition across four months of OSUT training. Given the few number of time periods in the OSUT sample, we adopted a *completely general* parameterization of time for the OSUT EHA models. Thus, the EHA models of OSUT attrition had a separate intercept for each month of OSUT. These intercepts essentially reflected the hazard in each month of OSUT (see Figure 6.1).

Testing for Time-Varying Effects

As in earlier chapters, upon identifying the parameterization of time for the OSUT EHA models, we proceeded to fit a hierarchical discrete-time hazard model for each predictor, assessing *if* and *how* its effect on attrition varied over time. Table 6.8 displays the fit statistics for variables that either (a) had an unadjusted correlation with overall attrition (in the aggregate sample) of at least .05 in magnitude or (b) had a *c*-statistic in any of month of OSUT (summarized in Table 6.8) that was at least .55 in magnitude (at least 10% greater than chance discrimination of attritees/stayers).

Table 6.8 shows deviance statistics associated with each step of the hierarchal EHA model for each predictor. In Step 1, the parameterization of time was entered; in Step 2, the predictor itself was entered; and in Step 3, interaction terms between the predictor and dummy variables representing each month of OSUT were entered. Also shown in Table 6.8 are likelihood ratio test statistics indexing the increment in fit when Step 3 was added to the model (i.e., when the effect of the predictor was allowed to vary across time), and the PI (-2LL) statistic, indexing the proportion of improvement in full model fit achieved when Step 3 was added to the model. Predictor variables were designated as having "time varying" effects in the first column of Table 6.8 if the likelihood ratio test of the increment in fit achieved by adding Step 3 was statistically significant.

Table 6.8 reveals that the majority of administrative variables examined had effects that varied significantly across months of OSUT, whereas for survey variables, it was more of an even split (in terms of time-varying versus fixed). However, statistical significance does not speak to the magnitude (or the direction) of a time-varying effect. To assess the magnitude of such effects it is useful to review the *G* statistics reported in Table 6.8, as well as the *c*-statistics reported in Table 6.9. In the sections that follow we highlight the strongest time-varying effects for administrative and survey variables.

Time-Varying Effects among Administrative Variables

Based on the *G* statistics reported in Table 6.8 and the *c*-statistics in Table 6.9, the administrative variables with effects that varied most across time were MOS and enlistment term. The pattern of *c*-statistics for MOS across months of OSUT indicates that it discriminated between attritees and stayers best in the first and fourth months of OSUT (1st month $c = .750$, 2nd Month $c = .658$. The effect of enlistment term also appeared to be strongest in the first month of OSUT ($c = .597$), dropping off notably for the remaining months of OSUT.

Although the *G*- and *c*-statistics speak to the magnitude of the time-varying effect, they do not indicate the direction of the effect. Table 6.10 provides odds ratios for each of the administrative variables shown in Tables 6.8 and 6.9.

Examination of the odds ratios for enlistment term revealed that the strong effect in the first month of OSUT appeared to stem from the difference in attrition rates between Soldiers with five-year and four-year enlistment terms. Specifically, Soldiers with five-year enlistment terms were roughly 3.5 times as likely to attrit as Soldiers with four-year enlistment terms. Beyond the first month of OSUT, differences in attrition rates among Soldiers with different enlistment terms were less apparent. Examination of odds ratios for MOS revealed a complex pattern of findings. For example, in the first month of OSUT (where effects of MOS were strongest), Soldiers in Infantry MOS (all except 11X) or Armor MOS (19D and 19K) were more than 10 times *less* likely to attrit than Soldiers in Military Police MOS (95B). By the second month of OSUT, these differences had decreased to the point where Infantry and Armor Soldiers were roughly two times *less* likely to attrit than 95B Soldiers. In the third month of OSUT, the differences appeared to reverse for most of the Infantry and Armor MOS, with Soldiers in these MOS being *more* likely to attrit than 95B Soldiers (roughly 1.5 times more likely for 11B and 19D). Lastly, in the fourth month of OSUT, relatively few Soldiers from several of the Infantry and Armor MOS remained, so results were inconclusive.

Table 6.8. Model Fit Statistics for Assessing Time Varying Effects of Predictors of Overall OSUT Attrition

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 *v.* 3	PI (-2LL) Step 3
Administrative					
Time Varying					
OSUT MOS	16,050	15,951	15,647	304.5	75.5%
Gender	16,050	15,997	15,969	28.3	34.8%
Education Tier	15,973	15,910	15,895	14.1	18.1%
Marital Status at Entry	16,050	15,996	15,983	12.6	18.8%
Enlistment Term at Entry	15,999	15,971	15,933	37.4	57.4%
*High Quality Recruit	16,050	16,023	16,010	13.0	31.9%
*AFQT Category	16,044	16,021	15,990	30.6	57.7%
Fixed					
Race/Ethnicity	16,050	15,981	**15,972**	8.3	10.7%
Number of Dependents at Entry	16,050	15,999	**15,985**	14.6	22.3%
SRS Single Items					
Time Varying					
58. Level of stress/strain	8,767	8,640	8,624	15.9	11.2%
*01c. Desire to serve my country	8,733	8,717	8,707	9.9	37.4%
47. Work I enjoy most is available	8,758	8,703	8,686	17.3	24.0%
05. How long in DEP	8,742	8,675	8,654	21.3	24.1%
59. Current level of morale	8,772	8,695	8,678	16.7	17.8%
52. Advise male about joining Army	8,721	8,642	8,620	22.6	22.4%
25a. Never thought about quitting HS	8,694	8,599	8,590	8.6	8.2%
Fixed					
37. Medical advice against exercise	8,763	8,701	**8,694**	7.4	10.6%
36. # Serious injuries before Army	8,775	8,744	**8,741**	3.0	9.0%
42. How often smoke before DEP	8,778	8,752	**8,744**	7.6	22.2%
40. Medical waiver needed to join Army	8,734	8,734	**8,708**	25.7	100.0%
*24. Were you ever suspended	6,433	6,417	**6,412**	5.3	25.6%
*48. Difficult to find good civilian job	8,770	8,758	**8,751**	6.3	33.1%
35. Average fitness level before Army	8,775	8,735	**8,734**	0.8	2.0%
53. Advise female about joining Army	8,717	8,666	**8,660**	6.6	11.5%
SRS/AIM Composites					
Time Varying					
SRS Attrition Cognitions	8,790	8,465	8,430	35.6	9.9%
SRS Reasons for Leaving Army - Problems Adjusting	8,746	8,617	8,598	19.8	13.3%
*SRS Continuance Commitment	8,790	8,775	8,759	16.3	51.7%
*SRS Continuance Intentions	8,790	8,771	8,755	16.5	46.5%
*SRS Core Army Values - Duty, Integrity, Courage	8,789	8,770	8,756	13.5	41.5%
SRS Participation in DEP Activities	8,760	8,738	8,730	8.3	27.1%
SRS Reasons for Joining Army - Personal Growth	8,787	8,759	8,745	14.1	33.5%
SRS Military vs. Civilian - Time for Personal Life	8,637	8,607	8,595	11.7	28.5%
SRS Core Army Values - Loyalty, Selfless Service	8,789	8,757	8,730	26.4	45.1%

Table 6.8 (Continued)

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 *v.* 3	PI (-2LL) Step 3
SRS/AIM Composites					
Time Varying (Continued)					
SRS Military vs. Civilian - Quality of Work Life	8,738	8,705	8,697	8.1	20.0%
SRS Military vs. Civilian - Overall	8,739	8,700	8,685	14.7	27.3%
*SRS Affective Commitment	8,789	8,693	8,657	35.9	27.1%
AIM: Adjustment	6,406	6,341	6,322	19.6	23.1%
SRS Generalized Self Efficacy	8,772	8,524	8,494	29.3	10.5%
Fixed					
SRS Reasons for Leaving Army - All Reasons	8,782	8,657	**8,652**	5.1	3.9%
SRS Thoughts of Quitting High School	8,694	8,618	**8,611**	7.5	9.0%
SRS Reasons for Leaving Army - Deviance	8,720	8,676	**8,674**	1.5	3.3%
SRS Reasons for Quitting Previous Jobs	8,740	8,690	**8,688**	2.0	3.9%
SRS Trouble in School	8,685	8,639	**8,638**	1.1	2.4%
*AIM: Dominance	6,413	**6,411**	**6,408**	3.6	66.1%
*SRS Reasons for Joining Army - Family/Friends	8,778	**8,775**	**8,770**	5.8	71.7%
*SRS Military vs. Civilian Life - Pay	8,594	8,589	**8,583**	6.5	55.4%
AIM: Work Orientation	6,413	6,394	**6,391**	3.1	14.4%
SRS Reasons for Joining Army - Travel	8,786	8,744	**8,737**	7.5	15.2%
AIM: Agreeableness	6,414	6,382	**6,380**	1.7	5.0%
AIM: Dependability	6,407	6,373	**6,369**	3.6	9.5%
AIM: Physical Condition	6,407	6,338	**6,331**	6.8	9.0%

Note. Asterisked predictors were not listed in Table 6.4 because their unadjusted correlations with overall OSUT attrition were less than .05 in magnitude. Bolded -2LL values under Step 2 indicate the main effect of the predictor (across time) was not statistically significant. Bolded –2LL values under Step 3 indicate that the effect of the predictor on attrition did not vary significantly over time. *G* Step 2 *v.* 3 = Likelihood ratio test statistic for increment in fit of Step 3 over Step 2. PI (-2LL) Step 3 = Proportion of change in -2LL between Steps 1 and 3 accounted for when the predictor's effect was allowed to vary across time (i.e., the percentage improvement in full model fit when Step 3 was added to the model).

Table 6.9. c-Statistics by Month of OSUT for EHA Models of Overall OSUT Attrition

Predictor	*Wgt M c*	*SD c*	*c*-statistics 1st Month	2nd Month	3rd Month	4th Month
Administrative						
Time Varying						
OSUT MOS	.610	.068	.750	.595	.576	.658
Gender	.521	.024	.565	.523	.502	.548
Education Tier	.537	.020	.568	.542	.529	.513
Marital Status at Entry	.528	.022	.567	.534	.517	.511
Enlistment Term at Entry	.544	.026	.597	.534	.540	.541
*High Quality Recruit	.535	.016	.518	.523	.555	.514
*AFQT Category	.547	.009	.566	.542	.545	.551
Fixed						
Race/Ethnicity	.544	.010	.539	.559	.532	.537
Number of Dependents at Entry	.528	.016	.558	.532	.518	.520
SRS Single Items						
Time Varying						
58. Level of stress/strain	.603	.044	.683	.618	.576	.577
*01c. Desire to serve my country	.533	.036	.602	.506	.532	.571
47. Work I enjoy most is available	.563	.049	.660	.549	.557	.539
05. How long in DEP	.581	.041	.641	.594	.566	.528
59. Current level of morale	.567	.050	.663	.564	.552	.534
52. Advise male about joining Army	.549	.041	.627	.562	.518	.539
25a. Never thought about quitting HS	.575	.038	.633	.572	.574	.525
Fixed						
37. Medical advice against exercise	.534	.024	.568	.536	.532	.500
36. # Serious injuries before Army	.537	.020	.564	.537	.536	.507
42. How often smoke before DEP	.542	.029	.598	.549	.521	.536
40. Medical waiver needed to join Army	.522	.018	.554	.526	.514	.506
*24. Were you ever suspended	.538	.023	.526	.527	.562	.496
*48. Difficult to find good civilian job	.532	.029	.590	.537	.512	.531
35. Average fitness level before Army	.556	.010	.577	.554	.554	.553
53. Advise female about joining Army	.553	.030	.613	.552	.540	.543
SRS/AIM Composites						
Time Varying						
SRS Attrition Cognitions	.627	.068	.758	.642	.586	.596
SRS Reasons for Leaving Army - Problems Adjusting	.592	.057	.704	.598	.561	.572
*SRS Continuance Commitment	.529	.042	.607	.544	.498	.511
*SRS Continuance Intentions	.548	.052	.655	.547	.522	.546
*SRS Core Army Values - Duty, Integrity, Courage	.523	.052	.625	.523	.505	.493
SRS Participation in DEP Activities	.543	.019	.571	.556	.529	.526
SRS Reasons for Joining Army - Personal Growth	.543	.043	.632	.539	.522	.547
SRS Military vs. Civilian - Time for Personal Life	.556	.044	.633	.565	.538	.516
SRS Core Army Values - Loyalty, Selfless Service	.530	.064	.667	.509	.510	.554

Table 6.9. (Continued)

Predictor	*Wgt M c*	*SD c*	*c*-statistics 1st Month	2nd Month	3rd Month	4th Month
SRS/AIM Composites						
Time Varying (Continued)						
SRS Military vs. Civilian - Quality of Work Life	.540	.046	.625	.552	.514	.512
SRS Military vs. Civilian - Overall	.550	.048	.640	.558	.527	.516
*SRS Affective Commitment	.575	.062	.696	.584	.525	.619
AIM: Adjustment	.577	.062	.692	.578	.558	.528
SRS Generalized Self Efficacy	.614	.067	.749	.620	.576	.602
Fixed						
SRS Reasons for Leaving Army - All Reasons	.607	.049	.704	.607	.587	.583
SRS Thoughts of Quitting High School	.577	.041	.644	.575	.574	.528
SRS Reasons for Leaving Army - Deviance	.544	.022	.589	.540	.539	.535
SRS Reasons for Quitting Previous Jobs	.562	.017	.556	.574	.560	.528
SRS Trouble in School	.557	.008	.571	.550	.561	.551
*AIM: Dominance	.512	.037	.477	.505	.511	.579
*SRS Reasons for Joining Army - Family/Friends	.511	.027	.557	.509	.493	.548
*SRS Military vs. Civilian Life - Pay	.516	.033	.579	.520	.501	.496
AIM: Work Orientation	.537	.018	.570	.537	.533	.523
SRS Reasons for Joining Army - Travel	.553	.034	.623	.545	.544	.544
AIM: Agreeableness	.555	.015	.571	.545	.566	.533
AIM: Dependability	.560	.030	.609	.547	.568	.529
AIM: Physical Condition	.583	.032	.645	.585	.569	.567

Note. Weighted M_c = Mean *c* across months of OSUT weighted by the number of attritees in each month. SD_c = standard deviation of *c* across the months of OSUT. c-statistics that exceed .550 are highlighted (i.e., the given predictor discriminated between attritees and stayers by at least 10% over chance for the time period). Predictor variables preceded by asterisks had unadjusted correlations with overall OSUT attrition in the aggregate data that failed to reach .05 in magnitude.

Time-Varying Effects among Survey Variables

Based on the *G* statistics reported in Table 6.8, the survey variables with effects that varied most over time were SRS Affective Commitment, SRS Attrition Cognitions, and SRS Generalized Self Efficacy. The *c*-statistics shown in Table 6.9 indicate that the trend in predictiveness for these three variables was quite similar. Specifically, they all discriminated between attritees and stayers extremely well in the first month of OSUT, taking notable drops in prediction in the months that followed. This downward trend is also apparent in the odds ratios for these predictors as well (see Table 6.11). The fact that these three variables' predictiveness, as well the predictiveness of other attitudinal variables presented in Tables 6.9 (e.g., SRS Continuance Intentions), drops precipitously across time is consistent with findings from previous chapters and past research that shows the attitudes that are most predictive of behavior are those that are captured most proximally (in time) to the behavior (Fishbein & Ajzen, 1975).

Table 6.10. Odds Ratios for Administrative Variables by Month of OSUT for EHA Models of Overall OSUT Attrition

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4
Time Varying				
OSUT MOS (95B)				
11B	**0.06**	**0.48**	**1.56**	-[b]
11C	-	**0.51**	**1.81**	-
11H	-	**0.48**	0.96	-
11M	**0.05**	**0.43**	**1.53**	1.11
11X	**0.53**	1.17	**1.87**	-
12B	**0.62**	**0.72**	1.09	-[b]
12C	1.22	0.64	1.15	
13B	**0.38**	**0.72**	**1.94**	-
19D	**0.09**	0.72	**1.56**	0.93
19K	**0.11**	**0.55**	0.84	0.75
54B	1.06	1.13	0.97	0.96
95C	1.47	0.61	0.54	0.27
Gender (Male)	**4.20**	**2.06**	1.09	**2.35**
Education Tier (Tier 1)				
Tier 2	**2.22**	**1.77**	**1.52**	1.19
Tier 3	**4.92**	0.83	0.37	0.00
Marital Status at Entry (Single)	**2.77**	**1.84**	**1.41**	1.26
Enlistment Term at Entry (4 Yr)				
2 Yr	1.89	0.91	1.00	1.32
3 Yr	**1.49**	1.18	**1.33**	1.00
5 Yr	**3.52**	**1.46**	0.89	**1.62**
6 Yr	2.04	**1.66**	1.11	1.37
High Quality Recruit (Low Quality)	0.87	**0.83**	**0.64**	1.12
AFQT Category (Cat I)				
Cat II	2.00	0.99	0.98	1.96
Cat IIIa	2.94	1.45	1.13	2.28
Cat IIIb	1.72	1.13	1.46	1.56
Cat IV	2.01	1.21	1.29	2.71
Fixed				
Race/Ethnicity (White)				
Black	**0.74**			
Hispanic	**0.52**			
Other	**0.65**			
Number of Dependents at Entry (None)				
1	**1.53**			
2	**1.69**			
3	**1.50**			

Note. Reference groups for each variable are noted in parentheses. Odds ratios less than one indicate the given group was less likely to attrit than the reference group. Odds ratios greater than one indicate the given group was more likely to attrit than the reference group. Odds ratios that were statistically significant ($p < .05$) are bolded.

Table 6.11. Odds Ratios for SRS/AIM Variables by Month of Service for EHA Models of Overall OSUT Attrition

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4
SRS Single Items				
Time Varying				
58. Level of stress/strain	**2.12**	**1.57**	**1.31**	**1.33**
01c. Desire to serve my country	**0.70**	0.96	**0.87**	**0.79**
47. Work I enjoy most is available	**0.52**	**0.82**	**0.81**	0.87
05. How long in DEP	**0.60**	**0.72**	**0.79**	1.13
59. Current level of morale	**0.53**	**0.75**	**0.81**	0.84
52. Advise male about joining Army (Not Army)	**0.21**	**0.38**	**0.70**	**0.50**
25a. Never thought about quitting HS (Thought)	**0.32**	**0.53**	**0.52**	0.78
Fixed				
37. Medical advice against exercise (No)	**2.40**			
36. # Serious injuries before Army (None)	**1.52**			
42. How often smoke before DEP (Never/Rarely)	**1.40**			
40. Medical waiver needed to join Army (No)	**1.61**			
24. Were you ever suspended (No)	**1.35**			
48. Difficult to find good civilian job	**0.89**			
35. Average fitness level before Army	**0.81**			
53. Advise female about joining Army (Not Army)	**0.61**			
SRS/AIM Composites				
Time Varying				
SRS Attrition Cognitions	**2.36**	**1.73**	**1.44**	**1.50**
SRS Reasons for Leaving Army - Problems Adjusting	**1.91**	**1.43**	**1.26**	**1.34**
SRS Continuance Commitment	**0.66**	**0.83**	1.00	0.95
SRS Continuance Intentions	**0.55**	**0.87**	0.94	0.88
SRS Core Army Values - Duty, Integrity, Courage	**0.68**	**0.88**	0.94	0.95
SRS Participation in DEP Activities	**0.77**	**0.81**	**0.89**	1.09
SRS Reasons for Joining Army - Personal Growth	**0.61**	**0.85**	0.92	**0.80**
SRS Military vs. Civilian Life - Time for Personal Life	**0.60**	**0.81**	**0.89**	0.96
SRS Core Army Values - Loyalty, Selfless Service	**0.57**	**0.90**	**0.91**	**0.78**
SRS Military vs. Civilian - Quality of Work Life	**0.70**	**0.82**	**0.90**	0.91
SRS Military vs. Civilian - Overall	**0.61**	**0.79**	**0.89**	0.94
SRS Affective Commitment	**0.48**	**0.71**	**0.88**	**0.64**
AIM: Adjustment	**0.51**	**0.74**	**0.83**	0.87
SRS Generalized Self Efficacy	**0.44**	**0.62**	**0.72**	**0.66**
Fixed				
SRS Reasons for Leaving Army - All Reasons	**1.36**			
SRS Thoughts of Quitting High School	**1.27**			
SRS Reasons for Leaving Army - Deviance	**1.20**			
SRS Reasons for Quitting Previous Jobs	**1.25**			
SRS Trouble in School	**1.23**			
AIM: Dominance	1.05			
SRS Reasons for Joining Army - Family/Friends	1.05			

Table 6.11. (Continued)

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4
SRS/AIM Composites				
Fixed (Continued)				
SRS Military vs. Civilian- Pay	**0.93**			
AIM: Work Orientation	**0.85**			
SRS Reasons for Joining Army - Travel	**0.82**			
AIM: Agreeableness	**0.81**			
AIM: Dependability	**0.81**			
AIM: Physical Condition	**0.74**			

Note. For categorical variables, unstandardized odds ratios are reported (reference groups noted in parentheses). For continuous variables, standardized odds ratios are reported. [a] If no odds ratios are listed beyond the first month for a given predictor, it indicates that the effect of the predictor did not significantly vary across time, and that the odds ratio presented reflects the main effect for that predictor across all months of OSUT. Statistically significant ($p <$ .05) odds ratios are bolded.

Multivariate Prediction Models

Using the model-fitting algorithm described in Appendix G, we arrived at a predictive model for each OSUT attrition criterion. For overall attrition, we provided two models: one that did not place any restriction on model content (Final Model A), and one that was limited to only those variables that would not preclude themselves from use in a selection context (i.e., a model without gender, MOS, and race; Final Model B). Table 6.12 shows the composition of the final prediction models for each attrition criterion.

Top Predictors

Table 6.13 shows odds ratios and change in –2LL statistics for predictors in models of overall OSUT attrition. Based on these models, the strongest predictors of OSUT attrition were SRS Attrition Cognitions, MOS, and SRS Item 5 (How long in DEP). When MOS, gender, and race were removed from the model, SRS 57a (Potentially leave Army: Fail physical requirements) joined SRS Attrition Cognitions and SRS Item 5 as the top predictors in the model. Interestingly, education tier and gender, historically identified as two of the top predictors of first term attrition, failed to play a large role in the predictive model of overall OSUT attrition.

Table 6.14 shows odds ratios and change in –2LL statistics for predictors in models of Medical and Performance OSUT attrition. The top predictors of Medical attrition in OSUT were race (minorities less likely to attrit), AFQT category (non-Cat I Soldiers more likely to attrit), MOS, and SRS Attrition Cognitions. The top predictors of Performance attrition in OSUT were MOS, SRS Attrition Cognitions, and SRS Item 25a (Never thought about quitting high school). In addition to differences in top predictors, a few other differences were notable between the Medical and Performance models. First, the Performance model consisted of far fewer predictors (k= 7) then the Medical model (k=27). Second, consistent with our expectation, medical variables (e.g., SRS Items 36, 37, and 57g) were only predictive of Medical attrition.

Table 6.12. Variables in Final Multivariate Prediction Models of OSUT Attrition

Predictors	Type of Attrition		
	Overall	Medical	Perform
Administrative			
AFQT Category at Entry	A	X	
CDC BMI Category		X	
Education Tier at Entry	A,B	X	
Marital Status at Entry	A,B		X
Medical Failure: Cardiovascular	B		
Medical Failure: Physical Extremities	B		
OSUT MOS	A	X	X
Race/Ethnicity	A	X	
Gender	A		
Youth Program Participation	A,B	X	
SRS Single Items			
01b. Army recruiter	A		
01m. Military tradition in family	A	X	
01u. Make Army a career	B		
02a. Parent(s)/Guardian(s)		X	
02d. Wife/Husband/Girlfriend/Boyfriend		X	
02n. Printed advertisement		X	
05. How long in DEP	A,B	X	X
20. Average grades in high school	A	X	
24. Were you ever suspended			X
25a. Never thought about quitting HS	A,B		X
25b. Family need		X	
25e. Got married or became a parent		X	
26b. Participated in Drama, music, art	A		
36. # Serious injuries before Army		X	
37. Medical advice against exercise	A,B	X	
38l. Left job to join the military	A,B	X	X
40. Medical waiver needed to join Army	A	X	
54a. Don't have any uncertainty	A,B	X	
57a. Fail physical requirements	A,B	X	
57g. Illness/medical condition	A,B	X	
58. Level of stress/strain	B		
SRS Composites			
Attrition Cognitions	A,B	X	X
Core Army Values - Duty, Integrity, Courage	A,B	X	
Generalized Self Efficacy	A	X	
Participation in High School Activities	B	X	
Reasons for Joining Army - Escape Problems		X	
Reasons for Quitting Previous Jobs	A,B	X	

Note. A = Predictor is part of Final Model A (no restrictions on model content). B = Predictor is part of Final Model B (model excludes, gender, race, and MOS). X = Predictor is part of the final model for the given type of OSUT attrition.

Table 6.13. Odds Ratios for Variables in Final Multivariate Prediction Models of Overall OSUT Attrition

	Final Model A		Final Model B	
Predictor	*OR*	Δ -2LL	*OR*	Δ -2LL
Administrative				
AFQT Category at Entry (Cat I)		19.1		
Cat II	**1.43**			
Cat IIIa	1.83			
Cat IIIb	2.01			
Cat IV				
Education Tier at Entry (Tier 1)		9.3		9.2
Tier 2	1.44		1.40	
Tier 3	**0.84**		**0.75**	
Marital Status at Entry (Single)	1.77	23.3	1.75	24.9
Medical Failure: Cardiovascular (No)			1.75	4.3
Medical Failure: Physical Extremities (No)			1.55	4.1
OSUT MOS (11X)		51.3		
11B	0.51			
11C	**0.64**			
11H	0.35			
11M	0.62			
12B	0.41			
12C	0.46			
13B	0.63			
19D	0.56			
19K	0.38			
54B	0.63			
95B	0.51			
95C	0.38			
Race/Ethnicity (White)		25.5		
Black	0.75			
Hispanic	0.58			
Other	0.50			
Gender (Male)	1.57	5.9		
Youth Program Participation (None)		8.3		9.0
JROTC/ROTC- Army	**0.68**		0.64	
JROTC/ROTC- Other Service	1.68		**1.54**	
Other Program	**1.78**		**1.75**	
SRS Single Items				
01b. Army recruiter	1.57	5.9		
01m. Military tradition in family	1.08	3.9		
01u. Make Army a career			1.12	7.5
05. How long in DEP	0.77	38.0	0.81	29.0
20. Average grades in high school	1.10	5.3		
25a. Never thought about quitting HS (No)	0.73	11.2	0.77	8.4
26b. Participated in Drama, music, art	1.11	7.1		
37. Medical advice against exercise (No)	1.41	6.1	1.52	10.2

Table 6.13. (Continued)

Predictor	Final Model A		Final Model B	
	OR	Δ -2LL	*OR*	Δ -2LL
SRS Single Items (Continued)				
38l. Left job to join the military (No)	0.79	8.3	0.75	14.1
40. Medical waiver needed to join Army (No)	1.48	10.3		
54a. Don't have any uncertainty (No)	1.39	17.5	1.38	17.9
57a. Fail physical requirements (No)	1.43	12.8	1.61	29.8
57g. Illness/medical condition (No)	1.35	10.3	1.34	10.8
58. Level of stress/strain			1.11	5.9
SRS Composites				
Attrition Cognitions	1.50	68.6	1.60	131.7
Core Army Values - Duty, Integrity, Courage	1.13	8.9	1.12	8.1
Generalized Self Efficacy	0.88	5.8		
Participation in High School Activities			1.09	6.1
Reasons for Quitting Previous Jobs	1.11	7.7	1.12	10.1

Note. For categorical variables unstandardized odds ratios are reported (reference groups are noted in parentheses). For continuous variables, standardized odds ratios are reported. Δ - 2LL = Change in -2LL when the given predictor is removed from the model. Variables that have no odds ratios for a given model were not part of that model. All odds ratios are significant ($p < .05$) except those that are bolded.

Model Validity/Utility

Table 6.15 shows validity and utility statistics for the final predictive models of OSUT attrition. Also shown in Table 6.15 are statistics for three reference models to help judge the validity and utility of our models against meaningful references. Specifically, we fit a reference model consisting of administrative variables only; another using only the best predictor of attrition in the sample (i.e., SRS Attrition Cognitions); and finally a model consisting of SRS Attrition Cognitions and administrative variables only.

Examination of Table 6.15 reveals several noteworthy findings. First, note that all of the final models generally provided good levels of discrimination between attritees and stayers. This was particularly true for the final model of Performance attrition in OSUT ($c = .778$), which discriminated between attritees and stayers at levels that were roughly 55% greater than chance. The discriminatory power of the Performance model was somewhat surprising in that it was composed of far fewer predictors than final models for Medical and overall OSUT attrition. Comparison of the "A" and "B" models of overall OSUT attrition revealed statistically significant, though small, differences in *c*-statistics and relatively small differences in point-biserial correlations with attrition (.31 for "A", .28 for "B"). These results indicate that the exclusion of gender, race, and MOS from Final Model B did not significantly harm its ability to predict attrition. Given the central role that MOS played in the "A" model of overall OSUT attrition, we were somewhat surprised that its exclusion failed to result in a notably less predictive model.

Results regarding the utility of these models were strong. For example, although the base rate of overall OSUT attrition was only 9.3% (in the model sample), the attrition rate among Soldiers who scored in the top 5% of the Model A composite (i.e., the predicted probabilities of

attrition resulting from Model A) was 40.2%. Thus, Soldiers scoring in this top 5% were 4.3 times more likely to attrit than the average Soldier in OSUT. Similarly strong utility figures emerged for models of Medical and Performance attrition in OSUT. For example, results regarding the utility of the Medical model indicate that Soldiers scoring in the top 5% of the Medical model composite were 4.6 times more likely to be Medical attritees than the average OSUT Soldier. Furthermore, Soldiers scoring in the top 5% of the Performance model composite were 4.13 times more likely to be Performance attritees than the average OSUT Solider. Nevertheless, findings with regard to the utility of the Performance model are somewhat tempered by the fact that a model based only on SRS Attrition Cognitions and administrative variables achieved a similar (actually, slightly better) level of utility.

Deviance Residual Analysis

To determine if the models were better at identifying some types of attritees than others, we examined correlations between the models' deviance residuals and Soldiers' exit survey responses. Results of these analyses are shown in Table 6.16. Across all models, we generally found weak correlations between deviance residuals and exit survey responses. Nevertheless, there were some notable findings. Perhaps the most consistent finding across models was the significant positive correlation found between attritees' residuals and how they felt the Army compared to their expectations. Such positive correlations suggest that the OSUT models fit better for attritees who indicated the Army was worse than they expected it to be. This finding was strongest for the model of Performance attrition. Based on correlations in Table 6.15, we also found that the overall and Performance models fit better for attritees who indicated: (a) they would not advise a friend to join the Army, (b) they were glad to be leaving the Army, and (c) they were leaving the Army because they were having problems adjusting. Lastly, we found significant positive relationships between Performance attritees' residuals and their level of satisfaction with several aspects of the entry process (i.e., Recruiter, MEPS, Reception Battalion) as well as OSUT itself. Such correlations suggest that the model of Performance attrition fit better for attritees who were less satisfied with OSUT and these aspects of the entry process. As a whole the findings presented above indicate that the OSUT models generally fit best for attritees who were displeased with their Army experience.

As a follow-up to analyses with exit survey variables, we also examined the correlation between deviance residuals based on predictions from the overall model of OSUT attrition (Final Model A) and Soldiers' day of attrition from OSUT. Analyses revealed a significant positive correlation ($r = .27$, $n = 858$) between these variables, indicating that the overall model fit better for attritees who separated earlier in OSUT. This finding is quite consistent with findings from previous chapters and the EHA results presented earlier that indicate the predictiveness of models based on pre-training data drop notably across time. We discuss this finding further in the final section of this chapter.

Table 6.14. Odds Ratios for Variables in Final Multivariate Models of Medical and Performance OSUT Attrition

Predictor	Medical Model		Performance Model	
	OR	Δ -2LL	*OR*	Δ -2LL
Administrative				
AFQT Category at Entry (Cat I)		26.0		
Cat II	**2.10**			
Cat IIIa	2.93			
Cat IIIb	3.38			
Cat IV	4.66			
CDC BMI Category (Normal)		8.2		
Underweight	**1.14**			
Overweight	**1.13**			
Obese	1.57			
Education Tier at Entry (Tier 1)		9.0		
Tier 2	1.49			
Tier 3	**0.43**			
Marital Status at Entry (Single)			2.40	14.3
OSUT MOS (11X)		26.4		64.1
11B	0.49		**0.74**	
11C	0.52		**0.55**	
11H	0.22		**0.60**	
11M	0.58		**1.19**	
12B	**0.70**		0.16	
12C	**0.79**		**0.55**	
13B	**0.77**		**1.18**	
19D	**0.73**		0.47	
19K	0.60		0.12	
54B	**0.91**		**0.71**	
95B	**0.75**		**0.71**	
95C	**0.62**		**0.69**	
Race/Ethnicity (White)		26.4		
Black	0.64			
Hispanic	0.45			
Other	0.54			
Youth Program Participation (None)		10.4		
JROTC/ROTC- Army	0.48			
JROTC/ROTC- Other Service	**1.37**			
Other Program	**3.51**			
SRS Single Items				
01m. Military tradition in family (No)	1.11	4.3		
02a. Parent(s)/Guardian(s) (No)	0.80	5.4		
02d. Wife/Husband/Girlfriend/Boyfriend (No)	1.34	6.5		
02n. Printed advertisement (No)	0.63	5.4		
05. How long in DEP	0.83	13.1	0.76	11.4
20. Average grades in high school	1.15	7.6		
24. Were you ever suspended (No)			1.50	6.7

Table 6.14. (Continued)

Predictor	Medical Model *OR*	Medical Model Δ -2LL	Performance Model *OR*	Performance Model Δ -2LL
SRS Single Items (Continued)				
25a. Never thought about quitting HS (Thought)			0.49	19.6
25b. Family need (No)	5.4	0.03		
25e. Got married or became a parent (No)	2.26	6.0		
36. # Serious injuries before Army	1.11	5.4		
37. Medical advice against exercise (No)	1.64	9.3		
38l. Left job to join the military (No)	0.82	3.9	0.60	11.4
40. Medical waiver needed to join Army (No)	1.66	12.9		
54a. Don't have any uncertainty (Uncertainty)	1.41	12.8		
57a. Fail physical requirements (No)	1.48	10.5		
57g. Illness/medical condition (No)	1.40	8.7		
SRS Composites				
Attrition Cognitions	1.32	21.0	1.50	42.6
Core Army Values - Duty, Integrity, Courage	1.19	11.6		
Generalized Self Efficacy	0.82	8.9		
Participation in High School Activities	1.16	9.3		
Reasons for Joining Army - Escape Problems	0.90	4.5		
SRS Reasons for Quitting Previous Jobs	1.20	15.0		

Note. For categorical variables unstandardized odds ratios are reported (reference groups are noted in parentheses). For continuous variables, standardized odds ratios are reported. Δ - 2LL = Change in -2LL when the given predictor is removed from the model. Variables that have no odds ratios for a given model were not part of that model. All odds ratios are significant ($p < .05$) except those that are bolded.

Structural Models of OSUT Attrition

The primary goal of building and fitting structural models of OSUT was to help the Army understand the mechanisms by which the most salient predictors of such attrition (and their antecedents) function. Unlike the empirically driven prediction models described above, here the focus was on explanation and understanding, rather than pure prediction. Nevertheless, as was the case in previous chapters, ideally, the vast majority of predictive variance from the empirical prediction models will be captured in the much smaller set of direct effects on attrition proposed in the structural models.

As a first step in the modeling process, we assessed the fit of the preliminary model of OSUT attrition and tested the significance of its hypothesized paths. Recall that the preliminary model was *essentially* the final structural model of overall BCT attrition identified in Chapter 4.[41] Table 6.17 shows model fit statistics for the preliminary structural model as well as the final structural models of OSUT attrition (described below).

[41] More specifically, the preliminary structural model of OSUT attrition *was* the final structural model of overall BCT attrition (including Fitness as a direct effect on attrition) with the exception that all instances of MOS: Combat Support and MOS: Combat Service Support were replaced by "all non-11B OSUT MOS" (11B served as the reference). The majority of OSUT MOS are Combat Arms and we did not see the Combat Arms vs. non-Combat Arms distinction as being particularly informative for modeling OSUT attrition.

Table 6.15. Validity and Utility Statistics for Final Multivariate Models of OSUT Attrition

			Model Validity					Model Utility			
				95% C.I. *c*							
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*	Attrit Rate Top 5%	Attrit Rate Top 10%	Attrit Rate Top 15%	Base Rate
Overall Attrition											
Final Model A	42	23	.736	.718	.754	.31	.43	.402	.298	.259	.093
Admin Only	32	11	.658	.639	.678	.18	.25				
BestPred Only	1	1	.626	.604	.647	.20	.28				
BestPred + Admin	33	12	.707	.688	.726	.27	.37	.345	.278	.238	.093
Final Model B	21	18	.715	.697	.733	.28	.39	.355	.280	.241	.093
Admin Only	32	11	.656	.637	.675	.17	.24				
BestPred Only	1	1	.622	.601	.643	.20	.28				
BestPred + Admin	32	11	.702	.684	.721	.26	.36	.335	.277	.236	.093
Medical Attrition											
Final Model	48	27	.747	.726	.769	.26	.42	.260	.194	.171	.057
Admin Only	36	11	.667	.644	.690	.15	.23				
BestPred Only	1	1	.611	.584	.637	.14	.23				
BestPred + Admin	36	11	.702	.680	.724	.20	.32	.209	.159	.135	.057
Performance Attrition											
Final Model	18	7	.778	.747	.808	.17	.38	.095	.082	.065	.023
Admin Only	18	4	.706	.670	.742	.11	.25				
BestPred Only	1	1	.640	.598	.682	.10	.22				
BestPred + Admin	16	4	.745	.710	.780	.15	.33	.105	.082	.069	.023

Note. *df* = Model degrees of freedom (i.e., number of parameters estimated). *k* = Number of model variables. *c* = c-statistic indexing the relationship between probabilities resulting from the given model and attrition criterion. 95% C.I. *c* = 95% confidence interval of *c*-statistic. Lower = lower bound of CI. Upper = upper bound of CI. r_{pb} = Point-biserial correlation. r_{pb}* = Adjusted point-biserial correlation. Attrit Rate Top 5% = Attrition rate among Soldiers scoring in the top 5% of the given model composite (i.e., the predicted probabilities of attrition resulting from the model). Attrit Rate Top 10% = Attrition rate among Soldiers scoring in the top 10% of the given model composite. Attrit Rate Top 15% = Attrition rate among Soldiers scoring in the top 15% of the given model composite. Base rate = Attrition rate in sample on which model is based. Admin Only = Model consisting of administrative variables only. BestPred Only = Model consisting of SRS Attrition Cognitions only. BestPred + Admin = Model consisting of SRS Attrition Cognitions and administrative variables only. All *c* and r_{pb} statistics are significant ($p < .05$).

Although the RMSEA statistics for the preliminary model indicated it provided very good fit to the data, not all of the paths in the model were significant, and it was apparent that some paths should be added. As such, we refined the preliminary model and were able to achieve very good levels of fit for structural models of each attrition criterion.

Table 6.16. Correlations between OSUT Attrition Model Deviance Residuals and Exit Survey Responses

	Overall				Medical Model		Perform Model	
	Model A		Model B					
Exit Survey Item/Composite	*n*	*r*	*n*	*r*	*n*	*r*	*n*	*r*
02. How Army compared with expectations	479	**.17**	512	**.20**	333	**.14**	121	**.31**
04. Health now vs. Army entry	480	.05	514	.04	336	-.02	120	**.19**
07. Feelings about leaving Army	487	**-.11**	522	**-.13**	340	-.06	123	**-.25**
11. Advice to male about Army	484	**.11**	519	**.18**	337	.05	124	**.21**
12. Advice to female about Army	478	**.11**	513	**.15**	331	.03	125	**.19**
Satisfaction								
03a. Satisfied-Recruiter	486	.06	521	**.12**	339	.07	123	**.22**
03b. Satisfied-Delayed Entry Program	469	.04	501	**.09**	329	-.02	116	.15
03c. Satisfied-MEPS	485	**.11**	519	**.17**	339	.06	123	**.28**
03d. Satisfied-Reception Station	487	**.12**	520	**.12**	340	.03	124	**.27**
03e. Satisfied-Basic Training/OSUT	425	.07	454	**.09**	295	-.01	118	**.20**
03f. Satisfied-Drill Sergeant	473	.04	504	**.11**	329	**.10**	123	.06
08. Satisfied with training received	485	**.10**	520	**.15**	339	**.10**	125	.11
Reasons for Leaving								
Reasons for Leaving Army - Deviance	494	.00	529	-.01	344	-.08	126	.12
Reasons for Leaving Army - Problems with Supervision	494	**-.12**	529	**-.14**	344	**-.11**	126	-.14
Reasons for Leaving Army - Problems Adjusting	494	**-.11**	529	**-.09**	344	-.06	126	**-.23**
Reasons for Leaving Army - Discrimination	494	-.05	529	-.04	344	-.08	126	.08
Reasons for Leaving Army - Physical/Medical Problems	494	-.03	529	-.03	344	.00	126	.01
Helped to Complete your Term								
06a. Accurate PS medical information	492	-.01	527	-.02	342	-.07	126	.05
06b. Improve counseling for adjusting	491	**-.10**	526	**-.10**	341	-.05	126	-.10
06c. Realistic preview of Army life	490	-.06	526	**-.07**	340	-.04	126	-.05
06d. Rigorous physical training prior	491	-.04	526	-.02	341	-.03	126	.04
06e. Inform family on support	490	**-.09**	525	**-.09**	340	-.08	126	-.07
06f. Maintain fair standards	490	**-.10**	525	**-.09**	340	-.09	126	.00
06g. Collect confidential feedback	490	**-.08**	525	**-.12**	341	-.05	125	.05
06h. More respect for recruits	490	-.06	524	**-.11**	341	-.03	124	-.06
06i. Incentives for good performance	490	-.04	525	-.06	341	.00	125	.00
06j. Value of Army benefits	491	-.02	526	-.02	342	.03	125	-.14

Note. Correlations were calculated for those OSUT attritees who had exit survey data. Deviance residuals were squared prior to correlating with exit survey responses. Bolded correlations are statistically significant ($p < .05$, one-tailed).

Like the structural models of BCT attrition, the structural models of OSUT attrition comprised four endogenous variables: the primary endogenous variable (i.e., attrition), and three secondary endogenous variables, namely Attrition Cognitions, Generalized Self Efficacy, and Stress/Strain. Table 6.18 shows the Multiple R^2 and R (i.e., multiple correlation coefficient) statistics that index the level of prediction obtained for each endogenous variable in the models. Although we achieved sizable Multiple R's for all outcomes, the validity of the Performance attrition model was slightly lower than that of the other models.

Table 6.17. Model Fit Statistics for Structural Models of OSUT Attrition

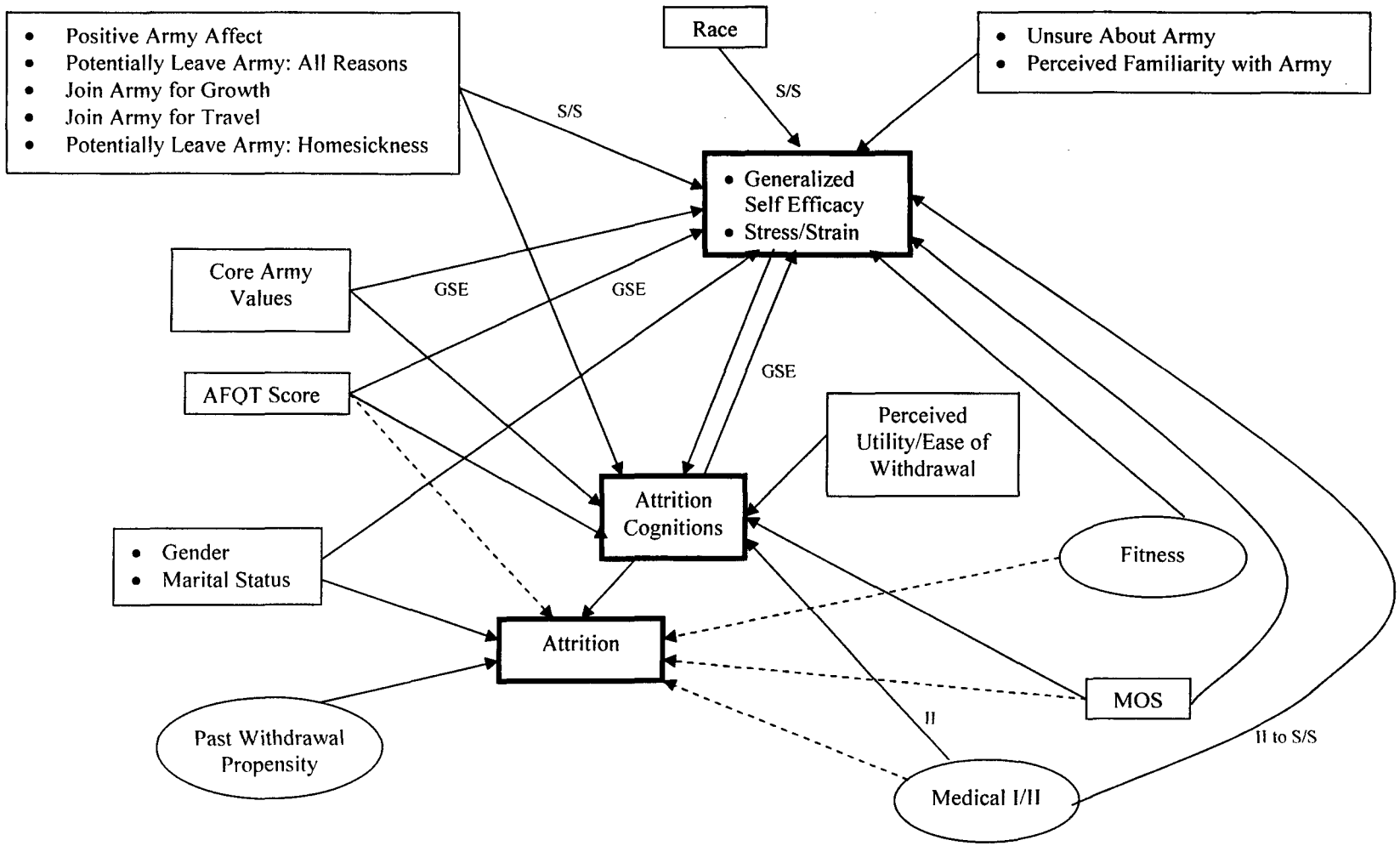
	Fit Statistic		
Criterion/Model	CFI	TLI	RMSEA
Overall Attrition			
Preliminary	.984	.966	.020
Final	.985	.974	.019
Medical Attrition			
Final	.983	.971	.020
Performance Attrition			
Final	.985	.975	.019

Note. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation.

As was the case with the final structural models of BCT attrition, examining the paths of the structural models of OSUT attrition revealed that differences in models of different attrition criteria were mainly found in the portion of the model dealing with direct effects on attrition. Figure 6.2 shows a general diagram of the final structural model of OSUT attrition; it depicts statistically significant effects on each of the endogenous variables noted above. In the pages that follow, we examine the relative strength of these effects and discuss the role of the demographic variables.

Table 6.18. Multiple R^2 and R Statistics for Endogenous Variables in Structural Models of OSUT Attrition

Model/Outcome	R^2	R
Overall		
Attrition	.17	.41
Attrition Cognitions	.74	.86
Generalized Self Efficacy	.89	.94
Stress/Strain	.26	.51
Medical		
Medical Attrition	.15	.39
Attrition Cognitions	.72	.85
Generalized Self Efficacy	.89	.94
Stress/Strain	.25	.50
Performance		
Performance Attrition	.10	.32
Attrition Cognitions	.72	.85
Generalized Self Efficacy	.88	.94
Stress/Strain	.25	.50



Note. Variables in bolded boxes were modeled as outcomes (*endogenous* variables). Variables in ovals are component scores (indicators omitted to simplify depiction of model; see Appendix H). Variables bulleted within the same box lead to the same endogenous variable(s). Dashed paths were contingent upon month of service or type of attrition examined (e.g., significant for Medical, but not Performance attrition). GSE = Path to Generalized Self Efficacy only. S/S = Path to Stress/Strain only. II = Path from Medical II to Attrition Cognitions only. II to S/S = Path from Medical II to Stress/Strain only. Note, the baseline version of this model has 90 degrees of freedom; the model depicted here has 45 (i.e., it constrains 45 paths to 0).

Figure 6.2. Final Structural Model of OSUT Attrition (Pre-Training Data Only)

Table 6.19 shows model parameter estimates and Wald statistics for the final structural model of OSUT attrition. Results presented in this table indicate that the variables with the strongest direct effects on overall OSUT attrition were Attrition Cognitions, Past Withdrawal Propensity, and gender. Note that these same predictors also had the strongest direct effects in structural models of overall BCT attrition. With regard to Medical and Performance attrition, Attrition Cognitions and Past Withdrawal Propensity again had the two strongest direct effects, but gender played less of a role in both models. Specifically, in the structural model of Medical attrition both Medical components appeared to have stronger direct effects on attrition than gender, and in the Performance model, marital status appeared to perform about the same as gender. Interestingly, only four variables in the model were found to have direct effects on Performance attrition: Attrition Cognitions, Past Withdrawal Propensity, gender, and marital status.

In addition to the variables mentioned above, several other variables were found to have direct effects on overall and Medical attrition in OSUT. In addition to having direct effects on Medical attrition, both Medical components had direct effects on overall attrition, such that recruits with pre-service medical problems were more likely to attrit than those who did not have such problems. AFQT score and Fitness also had direct effects on Medical and overall attrition in OSUT; however, their effects were small. In addition to having a direct effect on Performance attrition, marital status also had a direct effect on Medical and overall attrition in that married Soldiers were more likely to attrit. Lastly, MOS had a direct effect on Medical and overall attrition in OSUT such that Soldiers entering with the Unassigned Infantry MOS 11X were more likely to attrit than Soldiers in other OSUT MOS.

Like the structural models of BCT attrition, neither Perceived Utility/Ease of Withdrawal nor Deviance had direct effects on attrition. The effect of Perceived Utility/Ease of Withdrawal on attrition appeared to be indirect (through Attrition Cognitions), whereas the effect of Deviance was non-existent. Also like the structural models of BCT attrition, the direct effect of Fitness on attrition was one of the weakest effects. Once again, pre-service fitness appeared to have its primary impact on OSUT attrition indirectly through Generalized Self Efficacy (i.e., unfit Soldiers feel less confident about being able to succeed in the Army, which leads to higher levels of attrition cognitions, which in turn leads to being at higher risk for attrition).

With the exception of the MOS variables (discussed below), the portion of the OSUT model dealing with antecedents of other endogenous variables in the model (i.e., Attrition Cognitions, Generalized Self Efficacy, and Stress/Strain) was structurally identical to that of the BCT models. As such, we simply review the variables that had the strongest direct effects on these secondary endogenous variables. Variables with the strongest direct effects on Attrition Cognitions were Positive Army Affect, Generalized Self Efficacy (GSE), Stress/Strain, and SRS Item 57h (Potentially leave Army: Homesickness). That is, OSUT Soldiers who had the highest levels of Attrition Cognitions were those who didn't have positive feelings about the Army, were not confident they could succeed, reported high levels of stress prior to entering OSUT, and thought they might leave because they missed home. The strongest predictors of GSE were Attrition Cognitions, Fitness, and SRS Item 4 (Perceived familiarity with the Army). As was the case with the BCT attrition sample, we found support for a reciprocal relationship between GSE and Attrition Cognitions. Lastly, variables with the strongest direct effects on Stress/Strain were Positive Army Affect, race, and SRS Item 57h (Potentially leave Army: Homesickness). Once again, we found minorities (in particular blacks) reported less Stress/Strain prior to training than whites (controlling for other direct effects on Stress/Strain).

Table 6.19. Model Parameter Estimates and Wald Statistics for Final Structural Models of OSUT Attrition

	Model					
	Overall		Medical		Performance	
Outcome/Predictor	*b*	*Wald*	*b*	*Wald*	*b*	*Wald*
Attrition						
Intercept	1.19		1.28		1.82	
Attrition Cognitions	0.45	11.52	0.44	9.02	0.35	6.11
Past Withdrawal Propensity	0.18	10.21	0.13	6.25	0.20	7.31
Female	0.32	5.42	0.23	3.19	0.38	2.96
Medical I: Medical Waiver/Failure	0.08	4.39	0.09	4.37		
MOS: Unassigned Infantry (11X)	0.27	4.35	0.30	3.94		
Married	0.32	4.05	0.26	2.94	0.34	3.74
Medical II: Medical History Concerns	0.07	3.87	0.12	5.73		
AFQT Score	0.00	-3.57	-0.01	-3.50		
Fitness	-0.04	-2.07	-0.05	-1.95		
Attrition Cognitions						
Intercept	2.07		2.05		2.05	
Positive Army Affect	-0.41	-44.53	-0.39	-42.62	-0.40	-42.37
Generalized Self Efficacy	-0.29	-27.98	-0.31	-29.03	-0.31	-27.73
58. Stress/Strain	0.07	19.06	0.06	18.61	0.06	17.81
57h. Homesickness	0.19	16.96	0.19	17.01	0.20	16.75
Utility/Ease of Withdrawal	0.11	14.60	0.11	14.31	0.10	13.58
Medical II: Medical History Concerns	0.04	10.74	0.04	10.98	0.03	7.89
Reasons for Potentially Leaving Army- All	0.02	10.02	0.02	9.15	0.02	8.81
Core Army Values	-0.06	-8.41	-0.06	-7.72	-0.06	-8.38
Reasons for Joining Army- Personal Growth	-0.04	-7.12	-0.04	-6.74	-0.04	-6.89
AFQT Score	0.00	-5.20	0.00	-4.76	0.00	-4.52
Reasons for Joining Army- Travel	-0.02	-4.24	-0.02	-4.38	-0.02	-3.52
MOS: Unassigned Infantry	0.06	3.71	0.05	2.87	0.03	1.91
Generalized Self Efficacy						
Intercept	3.69		3.68		3.70	
Attrition Cognitions	-0.65	-53.23	-0.65	-51.01	-0.63	-47.22
Fitness	0.20	36.76	0.20	36.76	0.20	34.53
4. Perceived Familiarity with Army	0.08	14.59	0.08	14.59	0.08	14.37
Core Army Values	0.08	9.62	0.08	9.62	0.08	9.56
Unsure About Army Career	-0.05	-9.18	-0.05	-9.18	-0.05	-9.72
Female	-0.19	-9.08	-0.18	-9.08	-0.17	-7.67
AFQT Score	0.00	5.57	0.00	5.57	0.00	6.07
MOS: Infantry (11)	0.06	5.01	0.06	5.01	0.05	4.45
Married	0.04	2.09	0.03	2.09	0.05	2.34
Stress/Strain						
Intercept	3.64		3.61		3.59	
Positive Army Affect	-0.55	-20.35	-0.55	-19.74	-0.55	-19.48

Table 6.19. (Continued)

	Model					
	Overall		Medical		Performance	
Outcome/Predictor	*b*	*Wald*	*b*	*Wald*	*b*	*Wald*
Stress/Strain (Continued)						
Race: Black	-0.51	-13.52	-0.52	-13.55	-0.50	-12.82
57h. Homesickness	0.48	13.02	0.49	12.85	0.48	12.43
Unsure About Army Career	0.13	10.14	0.14	10.45	0.14	10.42
Race: Hispanic	-0.45	-10.84	-0.46	-10.89	-0.45	-10.63
Reasons for Potentially Leaving Army- All	0.05	9.57	0.05	9.28	0.05	9.21
4. Perceived Familiarity with Army	-0.10	-7.41	-0.10	-7.05	-0.09	-6.81
Race: Other	-0.37	-6.56	-0.37	-6.39	-0.38	-6.54
MOS: Infantry (11)	0.16	5.65	0.17	5.68	0.17	5.74
Fitness	-0.07	-4.85	-0.07	-4.81	-0.06	-4.51
Medical II: Medical History Concerns	0.06	4.64	0.06	4.30	0.06	4.16
Reasons for Joining Army- Personal Growth	0.07	4.37	0.07	4.49	0.07	4.57
Female	0.26	4.25	0.26	4.12	0.22	3.38
Married	0.18	3.92	0.19	3.96	0.19	3.78
Reasons for Joining Army- Travel	-0.05	-3.86	-0.05	-3.47	-0.05	-3.70

Note. For each outcome, predictors are sorted in descending order by magnitude of their Wald statistic in the overall OSUT model. Paths with Wald statistics that exceed 1.65 are statistically significant ($p < .05$, one-tailed).

Functioning of Demographic Variables

Recall that a secondary purpose in fitting the structural models of OSUT attrition was to gain a better understanding of how several demographic variables functioned. The models we examined provided insight into the functioning of gender, marital status, education tier, AFQT score, race, and MOS. The models indicated that gender and marital status had both direct and indirect (through GSE and Stress/Strain) effects on all types of OSUT attrition. The indirect effect of gender was such that females tended to be less confident and report more stress/strain than males prior to training, which led to higher levels of attrition cognitions, and in turn, to a higher risk of attrition. The indirect effect of marital status was interesting in that although married Soldiers reported higher levels of self efficacy, they also reported higher levels of stress/strain, and in turn were more likely to attrit than single Soldiers. In the models, we hypothesized that education tier served as an indicator of Past Withdrawal Propensity. As noted above, Past Withdrawal Propensity had one of the strongest direct effects on attrition.

The models revealed that AFQT score had a small direct effect on Medical and overall attrition, but no direct effect on Performance attrition. Furthermore, AFQT score was also found to have an indirect effect on attrition through GSE and Attrition Cognitions. The indirect effect was such that Soldiers with high AFQT scores tended to be more confident, experience lower levels of attrition cognitions, and in turn, have a lower risk of attrition than Soldiers with low AFQT scores.

Furthermore, the models revealed that race had no direct effect on attrition, but rather an indirect effect via its relationship with Stress/Strain. The indirect effect was such that minority Soldiers (blacks in particular) reported less stress/strain than white Soldiers, which led to lower levels of attrition cognitions, and in turn, a lower risk of attrition.

Lastly, the models indicated that MOS had both direct (as described earlier) and indirect effects (through Attrition Cognitions) on attrition. Specifically, Soldiers with an unassigned Infantry MOS (11X) at entry reported higher levels of Attrition Cognitions (and in turn, experienced higher levels of attrition) than Soldiers in other OSUT MOS. Interestingly, Soldiers in assigned Infantry MOS (regardless of designation, e.g., 11B, 11C, etc.) reported higher levels of Stress/Strain and GSE in comparison to Soldiers in other OSUT MOS.

Assessing the Practical Difference among Models of OSUT Attrition

As a final step in the modeling effort, we compared the predicted probabilities of attrition resulting from the structural and empirically-driven predictive models presented earlier. Specifically, we were interested in assessing: (a) the extent to which the simpler structural models were able to capture variance in the more saturated, empirically-driven predictive models, and (b) the degree to which the structural models could match the criterion-related validities of the predictive models. To answer these questions we first generated predicted probabilities of attrition based on variables that had direct effects on attrition in the structural models[42], and then examined their pattern of correlations with predicted probabilities resulting from the final predictive models, as well as attrition. In carrying out these analyses we were also able to examine how well models optimized for predicting overall attrition, were able to predict specific types of attrition (i.e. Medical or Performance).

Table 6.20 shows correlations among different models' predicted probabilities for each attrition criterion. The correlations among predicted values resulting from the structural and predictive models were quite high. These findings indicate that the simpler structural models we constructed were capturing a large amount of the variance in the more saturated predictive models. For example, the correlation between predicted probabilities resulting from the structural model of overall attrition and probabilities resulting from the Final Predictive Model A (of overall attrition) indicate that the structural model accounted for 74% of the variance (i.e., .86 squared) in the predictive model. This was despite the fact that the structural model required estimation of only nine parameters, whereas the predictive model required estimation of 42. Correlations among structural and predictive models of Medical and Performance attrition were also high, but notably weaker than those among the models of overall OSUT attrition.

Although the results shown in Table 6.20 indicate substantial overlap in prediction resulting from the structural and predictive models (particularly for overall attrition), they do not necessitate that the structural models match the predictive models in terms of their validity for predicting attrition. Indeed, examination of the *c*-statistics presented in Table 6.21 reveal that the structural models failed to perform as well as the predictive models for all types of attrition, and

[42] For each structural model, we entered the direct effects on attrition from that model into a logistic regression equation predicting the given type of attrition. The predicted probabilities from these analyses are what we refer to as predicted probabilities of attrition resulting from the structural models.

in particular Performance and Medical attrition. Nevertheless, it is important to realize that the structural models required the estimation of far fewer parameters relative to the more empirically-driven prediction models (e.g., 48 v. 9 for the predictive and structural models of Medical attrition, respectively). As such, upon cross-validation, one would expect to see more comparable levels of validity for the structural than the predictive models of OSUT attrition. Specifically, one would expect more shrinkage among validities for the predictive models due to their notably larger number of parameters, as well as the fact that they were primarily driven by raw empiricism (rather than being informed by theory). Taken together, these findings indicate we were able to capture much (but obviously, not all) of the key variance in the predictive models with the smaller number of direct effects identified in the structural models.

Table 6.20. Correlations among Models' Predicted Probabilities of OSUT Attrition

	Overall			Medical		Performance	
Criterion/Model	A	B	S	P	S	P	S
Overall							
Predictive Model A							
Predictive Model B	.89						
Structural Model	.86	.85					
Medical							
Predictive Model	.85	.78	.72				
Structural Model	.83	.81	.96	.75			
Performance							
Predictive Model	.67	.63	.64	.42	.56		
Structural Model	.77	.82	.89	.58	.79	.67	

Note. "Boxed" values reflect correlations between probabilities for models of the same criterion. A = Final Predictive Model A (no restriction on model content). B = Final Predictive Model B (model excludes gender, race, and MOS), P = Final Predictive Model, S = Final Structural Model (direct effects only). n = 7,405 to 10,353. All correlations are statistically significant ($p < .05$, one-tailed).

Table 6.21. Comparison of OSUT Models' Performance Across Attrition Criteria

		OSUT Attrition Criterion					
		Overall		Medical		Performance	
Model	*df*	*c*	SE_c	*c*	SE_c	*c*	SE_c
Overall							
Predictive Model A	42	.736	.009	.724	.011	.712	.017
Predictive Model B	21	.715	.009	.699	.012	.695	.016
Structural Model	9	.707	.009	.684	.012	.696	.017
Medical							
Predictive Model	48	.716	.009	.747	.011	.622	.019
Structural Model	9	.702	.009	.686	.012	.680	.017
Performance							
Predictive Model	18	.674	.011	.604	.014	.778	.016
Structural Model	4	.687	.009	.656	.012	.690	.017

Note. *df* = Model degrees of freedom (i.e., number of parameters estimated). *c* = c-statistic indexing the relationship between probabilities resulting from the given model and attrition criterion. SE_c = Standard error of the *c*-statistic. 95% All *c* statistics are significant ($p < .05$).

Further examination of Table 6.21 also reveals that when the predicted probabilities resulting from the *structural* model of overall attrition were used to predict Medical and Performance attrition, they performed about the same as the type-specific structural models. For example, when predicted probabilities from the structural model of overall attrition were used to predict Medical and Performance attrition, the *c*-statistics were .684 and .696, respectively. Contrast these with the *c*-statistics found when using the structural models of Medical and Performance attrition for predicting their given type of attrition (.686 and .690), and it is apparent that the overall structural model performed comparably.

DISCUSSION

Summary of Key Findings

Below is a summary of the results associated with the nine research questions examined in this chapter. A discussion of how results from this chapter might be leveraged by the Army to reduce OSUT attrition is provided in Chapter 9.

1. Does the frequency or composition of OSUT attrition (e.g., medical *v.* performance) vary by month of OSUT? If so, how?

The overall attrition rate through four months of OSUT was 8.8%. Soldiers were at greatest risk for OSUT attrition in their second and third months of OSUT (Hazards = .034 and .038, respectively). Indeed, 81.1% of all OSUT attrition occurred between months two and three. Consistent with findings presented in Chapter 2, we found that Medical and Performance attrition accounted for the vast majority of OSUT attrition (88%). Across all months of OSUT, Medical attrition accounted for 59.1% of attrition, whereas Performance attrition accounted for 29.1% of attrition. This distribution of Medical v. Performance attrition seems consistent with the physically demanding nature of the Combat Arms MOS that comprise the majority of the OSUT sample. Lastly, the base rate of Medical attrition in OSUT was 5.2%, whereas the base rate of Performance attrition in OSUT was 2.6%.

2. What pre-training variables have the strongest bivariate relationships with OSUT attrition?

The bivariate relationships between administrative variables and OSUT attrition were relatively weak in comparison to those for survey variables. No administrative variable had a *c*-statistic exceeding .570 in magnitude for predicting overall attrition (MOS was most predictive). SRS Attrition Cognitions emerged as the strongest correlate of OSUT attrition, having a lackluster correlation of .18 (again reflecting the low OSUT base rate), but a respectable *c*-statistic of .629. Other survey variables tapping into pre-service attitudes and beliefs also fared reasonably well in predicting OSUT attrition. Notably, both SRS Generalized Self Efficacy and SRS Item 58 (Level of stress/strain) had *c*-statistics over .60. Variables reflecting past withdrawal, core Army values, pre-training fitness, medical condition, pre-service deviant behavior, and Emotional Stability (e.g., SRS Number of Potential Reasons for Leaving-Problems Adjusting, AIM Adjustment) were also represented in this list of top correlates of OSUT attrition.

Analyses by criterion type (i.e., Medical *v.* Performance attrition) revealed that several of the top correlates of OSUT attrition appeared to be differentially predictive of Medical and Performance attrition. Among administrative variables, gender, race and MOS appeared to have the largest differences in validity for predicting Medical and Performance attrition. For example, gender and race appeared to be more predictive of Medical Attrition, whereas MOS appeared to have a stronger relationship with Performance attrition. With regard to survey variables, SRS Item 37 (Medical advice against exercise), SRS Item 36 (Number of serious injuries before Army), SRS Item 40 (Medical waiver needed to join Army), and SRS Reasons for Quitting Previous Jobs were notably more related to Medical attrition than they were to Performance attrition. Conversely, SRS Item 25a (Never thought about quitting high school), as well as several SRS and AIM composite variables (e.g., SRS Trouble in School, SRS Potential Reasons for Leaving the Army- Problems Adjusting, AIM Agreeableness, Dependability, and Physical Conditioning) were more related to Performance attrition than they were to Medical attrition. With the exception of the medical variables being more related to Medical attrition, we found such a pattern of findings difficult to explain. For example, SRS Reasons for Quitting Previous Jobs and SRS Thoughts of Quitting High School may both reflect past propensity for withdrawal (see Appendix H) but the Quitting Jobs composite was far more related to Medical Attrition (relative to performance) and the Quitting High School composite was far more related to Performance attrition (relative to medical).

3. Do bivariate relationships between pre-training variables and OSUT attrition vary by the month of OSUT when attrition occurs? If so, how?

The majority of administrative variables we examined had effects that varied significantly across months of OSUT, whereas for survey variables it was more of an even split (in terms of time-varying versus fixed). The administrative variables with effects that varied most across time were MOS and enlistment term. The pattern of *c*-statistics for MOS across months of OSUT indicates that it discriminated between attritees and stayers best in the first and fourth months of OSUT (where the least OSUT attrition occurred). The effect of enlistment term appeared to be strongest in the first month of OSUT, dropping off notably for the remaining months. The survey variables with effects that varied most over time were SRS Affective Commitment, SRS Attrition Cognitions, and SRS Generalized Self Efficacy. Each of these variables discriminated between attritees and stayers extremely well in the first month of OSUT, dropping notably in prediction in the months that followed. The fact that these three variables' predictiveness, as well the predictiveness of other attitudinal variables we examined (e.g., SRS Continuance Intentions), dropped precipitously across time is consistent with findings from previous chapters and past research that shows the attitudes that are most predictive of behavior are those that are captured most proximally (in time) to the behavior (Fishbein & Ajzen, 1975).

4. How well can we predict OSUT attrition with models that employ multiple pre-training variables?

All of the final models of OSUT attrition we examined generally provided good levels of discrimination between attritees and stayers. This was particularly true for the final model of Performance attrition in OSUT ($c = .778$), which discriminated between attritees and stayers at levels that were roughly 55% greater than chance. The discriminatory power of the Performance

model was somewhat surprising in that we were able to achieve it with far fewer predictors than we had in either the Medical or overall model.

Results regarding the utility of these models for identifying Soldiers at high risk of OSUT attrition were quite strong. Soldiers scoring in the upper percentiles (e.g., 5%) of the model composites were at notably greater risk for OSUT attrition than the average Soldier (e.g., four times greater for the "A" model of overall attrition). Such findings indicate that models consisting only of pre-training data may hold great utility for identifying Soldiers at heightened risk for attrition in OSUT.

5. What pre-training variables play the most prominent role in multivariate models of OSUT training attrition?

Based on the multivariate *predictive* models, the strongest predictors of overall OSUT attrition appeared to be:

- SRS Attrition Cognitions
- MOS
- SRS Item 5 (How long in DEP)

When MOS, gender, and race were removed from the model, SRS 57a (Potentially leave Army: Fail physical requirements) joined SRS Attrition Cognitions and SRS Item 5 as the top predictors in the model. Interestingly, education tier and gender, historically identified as two of the top predictors of first term attrition, failed to play a large role in predictive models of overall OSUT attrition.

SRS Attrition Cognitions and MOS were also among the top predictors in the multivariate predictive models of Medical and Performance attrition. Additionally, top predictors of Medical attrition in OSUT were race (i.e., minorities were less likely to attrit) and AFQT category (i.e., non-Category I Soldiers were more likely to attrit). For Performance attrition, SRS Item 25a (Never Thought About Quitting High School) also emerged as a top predictor. In addition to differences in top predictors, a few other differences were noted between the Medical and Performance models. First, the Performance model consisted of far fewer predictors (k= 7) than the Medical model (k=27). Second, medical variables (e.g., SRS Items 36, 37, and 57g) were only predictive of Medical attrition.

Like our *structural* models of BCT attrition, our structural model of overall OSUT attrition revealed that Attrition Cognitions, Past Withdrawal Propensity, and gender had the strongest direct effects on attrition. Also having direct effects on attrition were AFQT and Fitness (though such effects were small), marital status, MOS (specifically, unassigned infantry *v.* all other OSUT MOS), and medical factors, namely Medical I (Medical Waiver/Failure) and Medical II (Medical History Concerns). With regard to Medical and Performance attrition, Attrition Cognitions and Past Withdrawal Propensity again had the two strongest direct effects, but gender played less of a role in both models. Specifically, in the structural model of Medical attrition, both Medical components appeared to have stronger direct effects on attrition than gender, and in the Performance model marital status appeared to perform about the same as gender. Interestingly,

only four variables in the model were found to have direct effects on Performance attrition: Attrition Cognitions, Past Withdrawal Propensity, gender, and marital status.

6. Can we achieve similar levels of prediction with models that exclude variables that cannot be used in a selection context (e.g., gender, race, MOS)?

Comparison of Final Models A (no restrictions on model content) and B (model excluding gender, race, and MOS) of overall OSUT attrition revealed statistically significant, though small, differences in *c*-statistics and relatively small differences in point-biserial correlations with attrition (.31 for "A", .28 for "B"). These results indicate that the exclusion of factors such as gender, race and MOS from model B did not significantly harm its ability to predict attrition. Given the central role that MOS played in the "A" model of overall OSUT attrition, we were somewhat surprised that its exclusion failed to result in a notably less predictive model.

7. Are the models of OSUT attrition we form better at identifying some types of attritees than others?

The most consistent finding in the analyses of model deviance residuals and attritees' exit survey responses was that all of the OSUT models fit better for attritees who indicated the Army was worse than they expected it to be. This finding was strongest for the model of Performance attrition. We also found that the overall and Performance models fit better for attritees who indicated: (a) they would not advise a friend to join the Army, (b) they were glad to be leaving the Army, and (c) they were leaving the Army because they were having problems adjusting. Lastly, we found that the model of Performance attrition fit better for attritees who were less satisfied with OSUT and various aspects of the entry process (e.g., recruiter, MEPS). As a whole the findings suggested that the OSUT models generally fit best for attritees who were displeased with their Army experience.

As a follow-up to the analyses with exit survey variables, we also examined the correlation between deviance residuals based on predictions from the overall model of OSUT attrition (Final Model A) and Soldiers' day of attrition from OSUT. Analyses revealed a significant positive correlation ($r = .27$) between these variables, indicating that the overall model fit better for attritees who separated earlier in OSUT. This finding is quite consistent with findings from previous chapters and the EHA results that indicate the predictiveness of pre-training data drop notably across time.

8. Can we identify a good-fitting structural model that helps us understand the processes that underlie OSUT attrition?

We were able to identify a structural model that not only provided excellent fit to the data, but that also aided in the understanding of the processes by which pre-training variables may come to impact OSUT attrition. Unlike the empirically-driven predictive models, the structural models suggest that very few factors have direct effects on OSUT attrition. The variables identified as having the strongest direct effects on attrition were Attrition Cognitions, Past Withdrawal Propensity, and gender.

In addition to determining what variables had direct effects on attrition, the structural models provided insight into factors that had indirect effects (i.e., those that underlie the direct effects on attrition). As noted earlier, the indirect effects on OSUT attrition were nearly identical to those found for BCT attrition in Chapter 4. For example, the model revealed that the primary antecedents of Attrition Cognitions (i.e., the variable with the strongest direct effect on OSUT attrition) were Positive Army Affect, Generalized Self Efficacy, Stress/Strain, and SRS 57h (Potentially leave Army: Homesickness). The strongest predictors of GSE were Attrition Cognitions (suggesting a reciprocal link), past physical fitness (as captured by Fitness), and perceived familiarity with the Army (SRS Item 4). As in the case of BCT attrition, past physical fitness appeared to have its strongest effect on OSUT attrition indirectly (through GSE) rather than directly. Lastly, given its role in predicting Attrition Cognitions, we also note that the strongest direct effects on Stress/Strain were Positive Army Affect, race, and SRS Item 57h (Potentially leave Army: Homesickness).

9. To what extent do predictions from theory-driven structural models of OSUT attrition overlap with predictions resulting from empirically-driven predictive models of OSUT attrition, and further, match their criterion-related validity?

Comparison of predictions resulting from the multivariate predictive and structural models revealed a high degree of overlap, particularly for models of overall (r =.86) and medical (r =.75) attrition. Such results indicate that the simpler, theory-driven structural models were accounting for a good deal of variance in the more saturated, empirically driven predictive models. Nevertheless, we found that the validities of the structural models for predicting OSUT attrition were consistently lower than those of the multivariate predictive models. This was particularly true for models of Performance attrition. We hypothesized that upon cross-validation, validities for the structural model and predictive model would become more similar. Specifically, one would expect more shrinkage in validities of the predictive models to occur due both their larger number of parameters, as well as the fact that they were primarily driven by raw empiricism (rather than being informed by theory). Taken together these findings indicate we were able to capture much (but not all) of the important variance in the empirically driven predictive models attrition with the smaller number of direct effects identified in the structural models.

CONCLUSIONS

The results presented in this chapter provide insight into the composition, prediction, and understanding of OSUT attrition. Nearly 9% of Soldiers who entered OSUT wound up attriting during training. Based on ISCs, medical issues accounted for 59.1% of OSUT attrition, and performance issues accounted for 29.1% of such attrition. This distribution of medical versus performance attrition seems consistent with the physically demanding nature of the Combat Arms MOS that comprise the majority of the OSUT sample.

To reduce OSUT attrition, it is important to identify factors that distinguish between Soldiers who attrit in OSUT and those who do not. As in earlier chapters, a number of the research questions in this chapter were aimed at identifying the best predictors of OSUT attrition. As part of this process, we considered hundreds of potential predictors that were either available

through administrative records or obtained from Soldiers' responses to the SRS. Further, we considered not only simple bivariate relationships between each predictor and OSUT attrition, but also the relationship between predictors and OSUT attrition in the context of multivariate models. As was the case with BCT attrition, our analyses revealed that the top predictors of OSUT attrition were consistent with those typically found in the literature on civilian turnover (e.g., thoughts of leaving, stress/strain, emotional stability, lack of confidence, past withdrawal behavior). Other top predictors, however, were more specific to the Army context (e.g., time in DEP, pre-training physical fitness, medical history). Note that these same variables emerged as top predictors of BCT attrition as well.

Although identifying single factors that distinguish OSUT atrittees from Soldiers who complete OSUT is important, such information is not necessarily helpful by itself for understanding why Soldiers attrit. For example, the very top predictor of OSUT attrition was a variable we called "attrition cognitions," which reflected the extent to which Soldiers had thoughts of attriting before they even began training. Although this knowledge is useful, it begs the question, "What leads some Soldiers to have these thoughts, and others not to have them?" For this reason, we also examined structural models of OSUT attrition to understand how the top predictors "work together" to affect BCT attrition and to understand the factors that underlie them. In general, these models were quite consistent with models of civilian turnover; at the same time, they differed in ways that were consistent with our expectations given (a) differences between OSUT attrition and civilian turnover, and (b) the type of predictors examined (e.g., pre-training attitudes, rather than in-service attitudes). For example, pre-service physical fitness and pre-service medical history played a role in models of OSUT attrition, whereas they are not part of civilian turnover models. Furthermore, *pre-training* positive feelings about the Army, self-confidence, perceived stress/strain, and homesickness were the primary drivers of attrition cognitions in our structural model of OSUT attrition; in the civilian literature, attrition cognitions are often modeled as functions of job satisfaction and perceived utility of withdrawal (Hom & Griffeth, 1995).

As in previous chapters, we also observed a decrement in the predictiveness of our OSUT attrition models across time. This was consistent with our expectations based on both the civilian turnover literature and the social psychology literature on attitude-behavior relations (Fishbein & Ajzen, 1975; Hom & Griffeth, 1995). The civilian turnover literature suggests that turnover intentions (equivalent to our "attrition cognitions") and the attitudinal variables that underlie them are the primary determinants of turnover. The social psychology literature indicates that the intentions and attitudes most relevant to any behavior are those assessed most proximally (in time) to the behavior in question. Thus, intentions and attitudes assessed *prior to* training (which play an important role in the overall model of OSUT attrition) will naturally become less relevant for predicting Soldiers' attrition the longer they remain in service. What these findings suggest is that we might have been able to predict later OSUT attrition better if we had re-assessed attrition cognitions and its attitudinal antecedents a few months into OSUT. They also speak to the importance of maintaining an up-to-date awareness of Soldiers' intentions and attitudes to understand their risk for attrition that occurs in the months that follow.

In sum, the analyses in this chapter revealed several variables and models that might be useful for identifying recruits at heightened risk for OSUT—particularly *early* OSUT—attrition.

As an example of just how useful the models we examined might be, we found that Soldiers scoring in the top 5% of our final OSUT empirical attrition model (40.2% attrition rate, Model A) were 4.3 times more likely to attrit than the average Soldier (9.3% attrition base rate). Though impressive, it is important to remember that 60% of Soldiers in the top 5% of this OSUT model actually completed OSUT. Thus, if this model were used to identify high-risk recruits, the rate of "false positives" would be extremely high. As such, careful thought should be given to how such information is used so that the impact on false positives is minimal. Regardless, it appears the Army may benefit by moving beyond education tier as the primary means of identifying recruits at high risk for OSUT attrition through consideration of variables identified in this chapter. With such information, the Army might potentially design a number of interventions that attempt to reduce OSUT attrition. Recommendations on how the Army could capitalize on this information are presented in Chapter 9.

CHAPTER 7: MODELING UNIT ATTRITION

Rodney A. McCloy and Dan J. Putka

OVERVIEW

This chapter describes (a) the composition of attrition during a Soldier's time in his/her operational unit (e.g., what types of attrition are most prevalent at various points in time), (b) bivariate relationships between "pre-unit" variables (i.e., variables gathered prior to Soldiers' entry into the unit—prior to or during initial entry training) and unit attrition through 48 months, (c) multivariate regression models tailored to maximize understanding of six types of unit attrition, and (d) structural models designed to facilitate understanding of two major types of unit attrition.

We address the following questions in this chapter:

1. Does the frequency or composition of attrition (e.g., moral character *v.* performance) vary by month in service? If so, how?
2. Which variables collected prior to unit service have the strongest bivariate relationships with unit attrition?
3. Do bivariate relations between pre-unit variables and attrition depend on the type of attrition examined? If so, how?
4. Do bivariate relations between pre-unit variables and attrition vary by the month in service when attrition occurs? If so, how?
5. How well can we predict the various attrition criteria using multivariate prediction models?
6. How well does a theoretical model of attrition, based on the civilian turnover literature, fit Army attrition data?
7. How well do attitudes and perceptions collected during unit assignment predict unit attrition later in a Soldier's enlistment (e.g., after 18 months of service)?
8. Do Soldiers vary in their initial status on select attitudinal variables or in the degree to which their attitudes change over time? If so, do any variables assessing individual characteristics help account for this variation?

METHOD

Sample

The sample examined in this chapter included all Soldiers in the study cohort who completed initial entry training and received an assignment to an Army unit (again, less those eliminated due to MOS training length issues cited in Chapter 2). A total of 53,176 Soldiers had unit attrition criterion data. Fewer Soldiers had data for any given survey, however, and thus the sample sizes for many of our analyses involved far fewer observations.

Data

Predictor data examined in this chapter can be divided into two types: "pre-unit" data and "in-unit" data. Pre-unit data were obtained from Soldiers prior to their assignment to units and include (a) demographic and background information from Army administrative records (e.g., gender, education, enlistment waivers), (b) Soldier Reception Survey (SRS) data gathered at reception battalions, (c) End-of-Training Survey data gathered at the end of basic training (EOTB), and (d) End-of-Training Survey data gathered at the end of initial entry training (EOTA) – either after advanced individual training (AIT) or after one-station unity training (OSUT). In-unit data were collected from Soldiers who were working in their assigned units and include information gathered from two Annual Surveys (AS01 and AS02). Certain tables also contain data from the AIM and from a survey administered during the Red phase of BCT, but we excluded these variables from our multivariate analyses because of sample selection (both AIM and Red Phase) and sample size (Red Phase) issues. Of the 53,176 Soldiers in the unit analysis sample, we obtained the following sample sizes for pre-unit data: 24,517 had SRS data, 20,337 had EOTB data, 16,620 had EOTA data (6,640 of these took the survey during OSUT), 13,092 had AIM data, and 1,970 had Red Phase data. Regarding in-unit data, 15,396 Soldiers had AS01 data and 13,766 had AS02 data. Table 7.1 presents the demographic makeup of the FY99 cohort and the unit analysis samples.[43]

Analyses

Composition of Attrition

To examine the distribution of attrition over time we constructed a life table (Singer & Willett, 2003). The life table lists (a) the number of Soldiers entering each month of service, (b) the number who attrited during that month, (c) the percentage of Soldiers entering that month who attrited (i.e., the *hazard rate*—the conditional attrition rate for that month of service), and (d) other information (detailed later) that can aid understanding of the extent to which attrition occurs at various points across the first term. To examine the composition of attrition in terms of type, we calculated the percentage of overall attrition falling into each attrition category described in Chapter 2 (e.g., moral character, performance, medical/physical) for each month of service. In addition, we report base rates of each type of unit attrition through 48 months of service.

Bivariate Relationships

As described in Chapter 3, we calculated raw and adjusted point-biserial correlations between the various pre-unit variables and the six types of unit attrition. For the in-unit sample, we included the following variables: (a) composites from the SRS, EOTB, and EOTA surveys, (b) single items from the SRS, EOTB, and EOTA that did not appear in composites, (c) performance data from a survey administered during the Red phase of BCT, (d) AIM composites, and (e) all administrative variables.

As in previous chapters, we report odds ratios for polytomous administrative variables, as well as adjusted point-biserial correlations and *c*-statistics to facilitate across-criterion comparisons.

[43] We report AIM and Red Phase sample sizes in the text for completeness, but these samples do not appear in Table 7.1 because no in-unit analyses were conducted on them.

Table 7.1. Demographic Makeup of the FY99 Cohort and the Analysis Samples for Unit Attrition

	FY99 Cohort		Total Analysis Sample		SRS Analysis Sample		EOTB Analysis Sample		EOTA Analysis Sample	
Group	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Total Sample	63,930		53,176		24,517		20,337		16,620	
Gender										
Male	51,107	79.9	43,497	82.6	21,080	86.0	15,860	78.0	14,574	87.7
Female	12,823	20.1	9,229	17.4	3,437	14.0	4,477	22.0	2,046	12.3
Race										
White	38,361	60.0	31,119	58.5	15,039	61.3	11,007	54.1	10,068	60.6
Black	15,325	24.0	13,101	24.6	5,464	22.3	5,834	28.7	3,723	22.4
Hispanic	6,890	10.8	6,042	11.4	2,690	11.0	2,316	11.4	1,891	11.4
Other	3,354	5.2	2,914	5.5	1,324	5.4	1,180	5.8	938	5.6
AFQT Category										
I	2,306	3.6	1,733	3.3	778	3.2	638	3.1	512	3.1
II	18,799	29.5	15,451	29.1	7,264	29.6	5,870	28.9	4,643	27.9
IIIA	18,247	28.6	15,332	28.8	6,922	28.2	5,769	28.4	4,677	28.1
IIIB	22,447	35.2	18,836	35.4	8,966	36.6	7,535	37.1	6,315	38.0
IV-V	2,009	3.1	1,722	3.2	557	2.3	505	2.5	452	2.7
Education Tier										
1	55,432	87.0	46,351	87.2	21,599	88.1	18,011	88.6	14,337	86.3
2	7,966	12.5	6,378	12.0	2,699	11.0	2,166	10.7	2,126	12.8
3	285	0.4	235	0.4	126	0.5	89	0.4	84	0.5

Notes. Subgroup sample sizes and percentages do not sum to the Total Sample figures for certain variables because of missing data. SRS = Soldier Reception Survey; EOTB = End of Training Survey (Basic Combat Training), EOTA = End of Training Survey (Advanced Individual Training). Of the 16,620 Soldiers in the EOTA sample, 6,640 took the survey during One-Station Unit Training (OSUT).

Table 7.1. (Continued)

Group	FY99 Cohort		Total Analysis Sample		AS01 Analysis Sample		AS02 Analysis Sample	
	n	%	*n*	%	*n*	%	*n*	%
Total Sample	63,930		53,176		15,396		13,766	
Gender								
Male	51,107	79.9	43,497	82.6	13,170	85.5	11,665	84.7
Female	12,823	20.1	9,229	17.4	2,226	14.5	2,101	15.3
Race								
White	38,361	60.0	31,119	58.5	9,212	59.8	8,082	58.7
Black	15,325	24.0	13,101	24.6	3,403	22.1	3,180	23.1
Hispanic	6,890	10.8	6,042	11.4	1,888	12.3	1,707	12.4
Other	3,354	5.2	2,914	5.5	893	5.8	797	5.8
AFQT Category								
I	2,306	3.6	1,733	3.3	550	3.6	535	3.9
II	18,799	29.5	15,451	29.1	4,723	30.7	4,363	31.7
IIIA	18,247	28.6	15,332	28.8	4,363	28.3	3,816	27.7
IIIB	22,447	35.2	18,836	35.4	5,253	34.1	4,663	33.9
IV-V	2,009	3.1	1,722	3.2	482	3.1	369	2.7
Education Tier								
1	55,432	87.0	46,351	87.2	13,846	89.9	12,578	91.4
2	7,966	12.5	6,378	12.0	1,433	9.3	1,105	8.0
3	285	0.4	235	0.4	67	0.4	51	0.4

Notes. Subgroup sample sizes and percentages do not sum to the Total Sample figures for certain variables because of missing data. AS01 = Annual Survey 2001; AS02 = Annual Survey 2002.

Event History Analyses (EHA)

As in previous chapters, we present an event history analysis of unit attrition. Details about this analysis appear in Chapter 3

Parameterizing Time

As in Chapter 3, we chose to parameterize time using piecewise functions rather than adopting a general parameterization (a different intercept for each month in unit).

To determine an appropriate parameterization of time for our EHA models of attrition, we fitted a series of polynomial and piecewise functions of time that we felt best described the trend in hazards across months of service (as revealed by the life table). We assessed the fit of these simpler parameterizations of time against the completely general parameterization to identify a parameterization that was parsimonious, yet accurately described attrition rates over time. To assess differences in the fit, we conducted likelihood ratio tests, and compared multiple fit criteria (e.g., AIC, BIC; Singer & Willett, 2003).

Modeling the Effects of a Predictor Across Time

The modeling process for the unit event history modeling analysis followed the process described earlier: (a) enter the parameterization for the baseline hazard, (b) enter the particular predictor of interest, and (c) test whether the predictor's effect on attrition varied across months of service. We identified significant time-varying effects using likelihood ratio tests, and we report odds ratios to identify how the effect varies over time. To understand *how* predictors varied in their relationship with attrition over time, we reported odds ratios resulting from the above discrete-time hazard models. For models where predictors did not vary significantly across time, we only reported the odds ratio for the predictor from Step 2 of our models. For models where predictors did vary significantly across time, we reported odds ratios for the predictor in each time period examined from Step 3 of the model. In addition, we present standardized odds ratios for predictors with continuous response scales and raw odds ratios for categorical predictors.

To complement the odds ratio information, we again calculated *c*-statistics within each of the 48 months of service based on predicted probabilities resulting from each predictor's model. For models where predictors did not vary significantly across time, we used predicted probabilities based only on the first two steps of the model (i.e., treating the effect of the predictor as fixed). For models where predictors did vary significantly across time, we used predicted probabilities based on the full model (i.e., treating the effect of the predictor as time varying). Reporting these *c*-statistics gave us an indication of how well a predictor discriminated between attrits and non-attrits in each time periods.

RESULTS

Composition of Attrition Across Months of Service

Table 7.2 shows the life table for the unit attrition sample. The life table reports an Overall attrition rate through 48 months of 26.5%. This base rate indicates the attrition rate in the aggregate sample of 55,114 Soldiers who entered their units. As described in Chapter 2, some of these Soldiers would later receive ISCs that we would omit from our analyses. For the in-unit sample, 1,938 Soldiers received the omitted ISCs. Because Table 7.2 includes these individuals until the time they received that ISC designation, the base rate reported in the life table is slightly lower than that reported later in the chapter. Table 7.2 shows that nearly one-fourth of all unit attrition (24.1%) occurs within the first 6 months. Soldiers were at greatest risk for attrition in their first 3 months in unit, accounting for 16.9% of all unit attrition. After this, the unit attrition rate becomes quite steady, with the hazard ranging from .006 to .100. (Note that he life table begins at the first month in unit. For the majority of Soldiers, this is the fourth month in service because most Soldiers spend their first 3 months in IET. As a result, the life table contains data for 45 months of in-unit time, with the 45th month equating to the 48th month of service.)

Table 7.2. Life Table for Unit Attrition

Month in Unit	Total Entering	In-Service	Attrit	Hazard P (Attrit)	Cumulative Unit Attrition Rate	Proportion of All Unit Attrition	Cumulative Proportion of All Unit Attrition
1	55,114	54,109	1,005	0.018	0.018	0.069	0.069
2	54,065	53,211	854	0.016	0.034	0.058	0.127
3	53,142	52,533	609	0.011	0.045	0.042	0.169
4	52,475	52,066	409	0.008	0.052	0.028	0.197
5	52,018	51,691	327	0.006	0.058	0.022	0.219
6	51,639	51,320	319	0.006	0.064	0.022	0.241
7	51,268	50,962	306	0.006	0.069	0.021	0.262
8	50,900	50,586	314	0.006	0.075	0.021	0.284
9	50,542	50,243	299	0.006	0.081	0.020	0.304
10	50,212	49,857	355	0.007	0.087	0.024	0.328
11	49,824	49,505	319	0.006	0.093	0.022	0.350
12	49,464	49,091	373	0.008	0.100	0.026	0.376
13	49,051	48,681	370	0.008	0.106	0.025	0.401
14	48,625	48,211	414	0.009	0.114	0.028	0.429
15	48,144	47,719	425	0.009	0.122	0.029	0.458
16	47,662	47,205	457	0.010	0.130	0.031	0.490
17	47,138	46,658	480	0.010	0.139	0.033	0.523
18	46,583	46,150	433	0.009	0.146	0.030	0.552
19	46,027	45,572	455	0.010	0.155	0.031	0.583
20	45,334	44,906	428	0.009	0.162	0.029	0.613
21	44,154	43,730	424	0.010	0.170	0.029	0.642
22	43,512	43,129	383	0.009	0.177	0.026	0.668
23	43,061	42,652	409	0.009	0.184	0.028	0.696
24	42,570	42,192	378	0.009	0.191	0.026	0.722
25	42,102	41,685	417	0.010	0.199	0.029	0.750
26	41,569	41,191	378	0.009	0.206	0.026	0.776
27	41,058	40,624	434	0.011	0.214	0.030	0.806
28	40,519	40,120	399	0.010	0.221	0.027	0.833

Table 7.2. (Continued)

Month in Unit	Total Entering	In-Service	Attrit	Hazard P (Attrit)	Cumulative Unit Attrition Rate	Proportion of All Unit Attrition	Cumulative Proportion of All Unit Attrition
29	39,957	39,607	350	0.009	0.227	0.024	0.857
30	39,101	38,809	292	0.007	0.233	0.020	0.877
31	37,828	37,538	290	0.008	0.238	0.020	0.897
32	34,974	34,700	274	0.008	0.243	0.019	0.916
33	28,009	27,811	198	0.007	0.246	0.014	0.929
34	23,959	23,804	155	0.006	0.249	0.011	0.940
35	23,690	23,560	130	0.005	0.252	0.009	0.949
36	23,315	23,165	150	0.006	0.254	0.010	0.959
37	22,563	22,419	144	0.006	0.257	0.010	0.969
38	21,273	21,170	103	0.005	0.259	0.007	0.976
39	19,578	19,473	105	0.005	0.261	0.007	0.983
40	16,524	16,449	75	0.005	0.262	0.005	0.988
41	12,597	12,535	62	0.005	0.263	0.004	0.993
42	9,052	8,999	53	0.006	0.264	0.004	0.996
43	6,006	5,976	30	0.005	0.265	0.002	0.998
44	3,925	3,906	19	0.005	0.265	0.001	1.000
45	1,550	1,544	6	0.004	0.265	0.000	1.000
Totals			14,609		0.265		

Note. Total Entering = Number of Soldiers entering the given month in unit. In-Service = Number of Soldiers still in service at the end of the given month in unit. Attrit = Number of Soldiers who attrited during the given month in unit. Hazard = Proportion of Soldiers that entered the given month in unit that attrited during that month (i.e., the conditional attrition rate for the given month). Cumulative Attrit Rate = Proportion of all Soldiers in the sample that attrited during or before the given month in unit. Proportion of All Attrit = Proportion of all attrits in the sample who attrited during the given month in unit. Cumulative Proportion of All Attrit = Proportion of all attrits in the sample that attrited during or before the given month in unit.

Figure 7.1 plots the hazard functions for the overall sample and the various survey samples (i.e., Soldiers who responded to a particular survey). The plots are rather similar to one another, although a couple of plots require comment. First, the attrition rate for the AIM sample is higher than that of the other samples, as expected. Second, the EOTA sample has a lower attrition rate during the first 6-8 months, and this function is unusual in that it is not highest in the first 3 months. We believe this pattern likely stems from the inaccuracy we surely experienced when estimating the in-unit dates for each Soldier. As described in Chapter 2, we estimated unit entry dates as a function of the Soldier's MOS as the training time assigned to that MOS. Should these estimates have been in error, we could be treating Soldiers as being in unit when in fact they are completing their stint in AIT or OSUT. Such Soldiers would be highly unlikely to attrit, given that they are just about to complete their training. Therefore, the EOTA hazard plot shown here might be artifactually low in the initial months because of our inability to pinpoint unit entry dates.

Table 7.3 provides base rates for the different attrition criteria through the first 48 months of service. Moral Character and Medical/Physical attrition had the highest base rates among specific types of attrition for the entire sample. Considering only females, however, we see that slightly more than 20% of females who complete IET later attrit because of pregnancy or parenthood. Thus, although the attrition rate for pregnancy/parenthood is low across the Army, the rate takes on new meaning when calculated on those truly at risk for pregnancy.

Table 7.3. Base Rates for the Six Unit Attrition Criteria

Sample	*n*	Stayed	Attrited	Base Rate (%)
Total Unit Sample				
Overall	53,176	38,567	14,609	27.5
Moral Character	45,320	38,567	6,753	14.9
Performance	40,550	38,567	1,983	4.9
Medical/Physical	40,823	38,567	2,256	5.5
Pregnancy/Parenthood*	7,290	5,789	1,501	20.6
Other	40,563	38,567	1,996	4.9
SRS				
Overall	24,517	18,018	6,499	26.5
Moral Character	21,111	18,018	3,093	14.7
Performance	18,880	18,018	862	4.6
Medical/Physical	19,027	18,018	1,009	5.3
Pregnancy/Parenthood	2,725	2,136	589	21.6
Other	18,918	18,018	900	4.8
EOTB				
Overall	20,337	15,248	5,089	25.0
Moral Character	17,568	15,248	2,320	13.2
Performance	15,767	15,248	519	3.3
Medical/Physical	16,017	15,248	769	4.8
Pregnancy/Parenthood	3,646	2,949	697	19.1
Other	16,000	15,248	752	4.7
EOTA				
Overall	9,980	7,778	2,202	22.1
Moral Character	8,857	7,778	1,079	12.2
Performance	7,913	7,778	135	1.7
Medical/Physical	8,056	7,778	278	3.5
Pregnancy/Parenthood	1,539	1,223	316	20.5
Other	8,149	7,778	371	4.6
AIM				
Overall	13,092	9,023	4,069	31.1
Moral Character	11,109	9,023	2,086	18.8
Performance	9,577	9,023	554	5.8
Medical/Physical	9,650	9,023	627	6.5
Pregnancy/Parenthood	1,070	816	254	23.7
Other	9,541	9,023	518	5.4
Red Phase				
Overall	1,970	1,518	452	22.9
Moral Character	1,719	1,518	201	11.7
Performance	1,582	1,518	64	4.0
Medical/Physical	1,574	1,518	56	3.6
Pregnancy/Parenthood	320	258	62	19.4
Other	1,584	1,518	66	4.2

Note. *Only females are considered in the figures for Pregnancy/Parenthood attrition.

Table 7.4 shows the composition of unit attrition by month in unit. During the first 4 months of assignment to a unit, the majority of attrition is due to performance problems. Indeed, combined with Medical/Physical attrition, these two categories account for about 81% of attrition during the first 3 months in unit. The fourth month serves as a transition month, with relatively similar attrition rates across the board (excepting Pregnancy/Parenthood). From that point on, however, Moral Character attrition reigns. From month 11 on, with the exception of 2 months near the end of the enlistment (when attrition rates are quite low), Moral Character attrition accounts for more than half of unit attrition. Pregnancy/Parenthood attrition is quite low

during the first 5 months and then increases to a relatively high level between months 8 and 15. In all, these data suggest that variables assessing medical conditions and physical fitness might predict quite well early on but then wane significantly, whereas variables assessing deviant behavior might increase in predictive power over time.

Bivariate Relationships between Pre-Unit Variables and Attrition

Overall Attrition

Table 7.5 presents correlations and *c*-statistics for administrative variables; single-item variables from the SRS, EOTB, and EOTA surveys; and composites from the SRS, EOTB, EOTA, and Red Phase surveys, as well as from AIM, with Overall attrition[44]. As in previous tables, we present only those variables having correlations $\geq .05$.[45] These results reveal that predictor-attrition relations were generally modest, with all single variables and composites correlating with attrition between +/- .15.

Among administrative variables, education tier and gender were the best predictors of overall attrition. Logistic regression analyses revealed the odds of attrition for Tier 2 Soldiers were 2.05 times greater than the odds of attrition for Tier 1 Soldiers, and that the odds of attrition for females were 1.74 times greater than the odds for males. As in Chapter 3, the odds of attrition for Tier 3 Soldiers were not significantly higher than the odds of attrition for Tier 1 Soldiers (*OR* = 1.24, *ns*). These findings are consistent with past research, which has identified education tier and gender as two of the strongest predictors of first-term attrition (Laurence et al., 1996).

Several survey variables achieved levels of prediction that were on par with, or slightly better than, that of gender and education tier. For example, several of the most predictive survey variables reflected juvenile deviance (e.g., SRS Item 42—pre-DEP smoking, SRS Trouble in School, SRS Item 16—Get into serious trouble, AIM Dependability).[46]

Variables reflecting past withdrawal (or conversely, past completion) tendencies also performed well (e.g., SRS Thoughts of Quitting High School, SRS Reasons for Quitting Jobs, SRS Item 5—Months in DEP). Finally, variables that could be viewed as indicators of levels of physical fitness during training (e.g., Red Phase—APFT1 and APFT2, EOTB—Medical Problems During Training, AIM Physical Conditioning) also predicted overall attrition. As in the total-sample analysis (Chapter 3), the heterogeneity of the overall attrition criterion yields successful predictors assessing a variety of dimensions: physical, character-related, and withdrawal-related.

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[44] In this and subsequent tables, refer to the survey booklets in Appendix A for the precise wording of the questions in the various surveys. In each table, we identify the survey and the question/response option number, and provide only a very short extract. The wording of the question stem is often crucial to understanding that extract.

[45] Given the large number of predictors we examined in this chapter, we decided to present results only for those predictors that had correlations with attrition that were of at least .05 in magnitude. This decision was made for several reasons: (a) the excluded predictors shared no more than one-quarter of one percent (0.25%) of their variance with the attrition criterion, (b) each of these variables would be re-evaluated in other chapters that focus on attrition during each major period of a Soldier's first term of service, and (c) an important goal of this chapter was to identify the top predictors of in-unit attrition. Therefore, we limited presentation of our results to predictors we believed to be most promising.

[46] Based on its pattern of correlations with other variables, low scorers on AIM Dependability appeared to be individuals who had problems with authority and or following rules. This is consistent with past Army work in which the negative pole of Dependability has been associated with deviance (Knapp, 2003).

Table 7.4. Composition of Unit Attrition by Month in Unit

Month in Unit	Total Entering	In-Service	Unit Attrit	Moral		Performance		Medical/ Physical		Pregnancy/ Parenthood		Other	
				Attrit	% of Unit Attrit	Attrit	% of Unit Attrit	Attrit	% of Unit Attrit	Attrit	% of Unit Attrit	Attrit	% of Unit Attrit
1	55,114	54,109	1,005	37	3.7	531	52.8	357	35.5	13	1.3	67	6.7
2	54,065	53,211	854	52	6.1	462	54.1	236	27.6	15	1.8	89	10.4
3	53,142	52,533	609	74	12.2	280	46.0	169	27.8	20	3.3	66	10.8
4	52,475	52,066	409	85	20.8	133	32.5	94	23.0	22	5.4	75	18.3
5	52,018	51,691	327	92	28.1	67	20.5	73	22.3	26	8.0	69	21.1
6	51,639	51,320	319	95	29.8	50	15.7	56	17.6	41	12.9	77	24.1
7	51,268	50,962	306	108	35.3	34	11.1	54	17.6	38	12.4	72	23.5
8	50,900	50,586	314	123	39.2	22	7.0	34	10.8	47	15.0	88	28.0
9	50,542	50,243	299	132	44.1	16	5.4	40	13.4	57	19.1	54	18.1
10	50,212	49,857	355	153	43.1	21	5.9	46	13.0	50	14.1	85	23.9
11	49,824	49,505	319	161	50.5	14	4.4	33	10.3	57	17.9	54	16.9
12	49,464	49,091	373	195	52.3	13	3.5	37	9.9	63	16.9	65	17.4
13	49,051	48,681	370	192	51.9	9	2.4	41	11.1	66	17.8	62	16.8
14	48,625	48,211	414	233	56.3	12	2.9	53	12.8	47	11.4	69	16.7
15	48,144	47,719	425	240	56.5	19	4.5	40	9.4	60	14.1	66	15.5
16	47,662	47,205	457	260	56.9	20	4.4	63	13.8	52	11.4	62	13.6
17	47,138	46,658	480	291	60.6	17	3.5	58	12.1	48	10.0	66	13.8
18	46,583	46,150	433	255	58.9	16	3.7	43	9.9	54	12.5	65	15.0
19	46,027	45,572	455	271	59.6	21	4.6	51	11.2	57	12.5	55	12.1
20	45,334	44,906	428	266	62.1	12	2.8	46	10.7	46	10.7	58	13.6
21	44,154	43,730	424	266	62.7	8	1.9	47	11.1	52	12.3	51	12.0
22	43,512	43,129	383	230	60.1	10	2.6	31	8.1	51	13.3	61	15.9
23	43,061	42,652	409	252	61.6	12	2.9	47	11.5	44	10.8	54	13.2
24	42,570	42,192	378	238	63.0	17	4.5	38	10.1	37	9.8	48	12.7
25	42,102	41,685	417	274	65.7	14	3.4	37	8.9	56	13.4	36	8.6
26	41,569	41,191	378	248	65.6	15	4.0	45	11.9	26	6.9	44	11.6
27	41,058	40,624	434	285	65.7	17	3.9	38	8.8	54	12.4	40	9.2

Table 7.4. (Continued)

Month in Unit	Total Entering	In-Service	Unit Attrit	Moral		Performance		Medical/ Physical		Pregnancy/ Parenthood		Other	
				Attrit	% of Unit Attrit	Attrit	% of Unit Attrit	Attrit	% of Unit Attrit	Attrit	% of Unit Attrit	Attrit	% of Unit Attrit
28	40,519	40,120	399	255	63.9	17	4.3	37	9.3	54	13.5	36	9.0
29	39,957	39,607	350	223	63.7	11	3.1	39	11.1	43	12.3	34	9.7
30	39,101	38,809	292	165	56.5	10	3.4	38	13.0	47	16.1	32	11.0
31	37,828	37,538	290	179	61.7	12	4.1	31	10.7	30	10.3	38	13.1
32	34,974	34,700	274	159	58.0	12	4.4	33	12.0	37	13.5	33	12.0
33	28,009	27,811	198	121	61.1	9	4.5	12	6.1	37	18.7	19	9.6
34	23,959	23,804	155	82	52.9	6	3.9	18	11.6	28	18.1	21	13.5
35	23,690	23,560	130	64	49.2	7	5.4	23	17.7	15	11.5	21	16.2
36	23,315	23,165	150	85	56.7	3	2.0	27	18.0	23	15.3	12	8.0
37	22,563	22,419	144	74	51.4	10	6.9	24	16.7	23	16.0	13	9.0
38	21,273	21,170	103	54	52.4	4	3.9	14	13.6	22	21.4	9	8.7
39	19,578	19,473	105	49	46.7	7	6.7	16	15.2	23	21.9	10	9.5
40	16,524	16,449	75	45	60.0	2	2.7	11	14.7	11	14.7	6	8.0
41	12,597	12,535	62	30	48.4	1	1.6	9	14.5	16	25.8	6	9.7
42	9,052	8,999	53	27	50.9	2	3.8	9	17.0	11	20.8	4	7.5
43	6,006	5,976	30	18	60.0	2	6.7	6	20.0	2	6.7	2	6.7
44	3,925	3,906	19	12	63.2	4	21.1	1	5.3	0	0.0	2	10.5
45	1,550	1,544	6	3	50.0	2	33.3	1	16.7	0	0.0	0	0.0
Totals			14,609	6,753	46.2	1,983	13.6	2,256	15.4	1,621	11.1	1,996	13.7

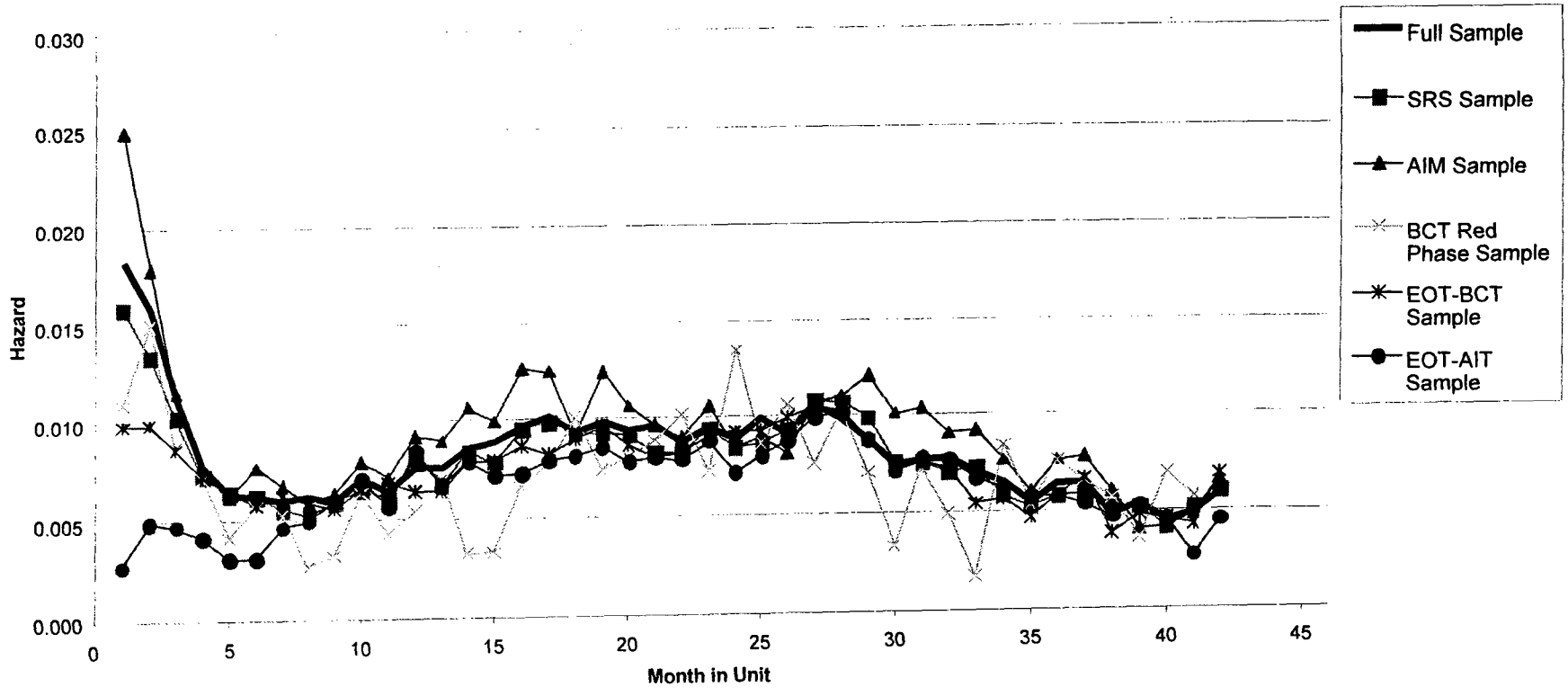


Figure 7.1. Hazard for Unit Attrition by Month in Unit and Sample

Table 7.5. Zero-Order Correlations and c-Statistics for Top Pre-Unit Predictors of Overall Attrition

Predictor	*n*	*r*	*c*	SE_c
Administrative				
Education Tier	52,964	.11	0.542	0.003
Gender	53,176	.10	0.543	0.003
Pay Grade at Entry	53,176	.08	0.538	0.003
Enlistment Term at Entry	52,994	.07	0.529	0.003
Race/Ethnicity (W/B/H/O)	53,176	.07	0.531	0.003
High Quality Recruit (HSG + Cat I-IIIa)	53,176	.06	0.535	0.003
AFQT Category	53,074	.06	0.532	0.003
SRS Single Items				
42. How often smoke before DEP	24,440	.14	0.578	0.004
25a. Never thought about quitting HS	24,014	-.13	0.566	0.004
25l. Other reasons (thought of quitting HS)	24,014	.10	0.535	0.004
24. Were you ever suspended?	20,401	.09	0.554	0.005
05. How long in DEP?	24,260	-.09	0.559	0.004
23. Were you ever expelled	20,398	.08	0.522	0.005
25j. Didn't get along with authorities	24,014	.07	0.517	0.004
25d. Bored, not learning anything	24,014	.07	0.526	0.004
25i. Wasn't going to graduate on time	24,014	.07	0.519	0.004
25c. Expelled or suspended	24,014	.07	0.514	0.004
25k. Wanted to work full time	24,014	.07	0.518	0.004
22a. Never sent to principal's office	24,067	-.07	0.537	0.004
25g. Didn't get along with students	24,014	.06	0.513	0.004
57a. Fail physical requirements	24,297	.06	0.527	0.004
02d. Wife/Husband/Girlfriend/Boyfriend	23,427	.06	0.526	0.004
35. Average fitness level before Army	24,482	-.06	0.538	0.004
38e. Left job-fired	24,298	.05	0.519	0.004
25f. Getting bad grades	24,014	.05	0.513	0.004
38l. Left job to join the military	24,297	-.05	0.526	0.004
20. Average grades in high school	24,308	-.05	0.529	0.004
SRS Composites				
Thoughts of Quitting High School	24,014	.13	0.571	0.004
Trouble in School	24,067	.12	0.567	0.004
Reasons for Quitting Previous Jobs	24,308	.08	0.546	0.004
Military vs. Civilian Life - Pay	24,027	.05	0.538	0.004
Reasons for Joining Army - Escape Problems	24,408	.05	0.532	0.004
Continuance Intentions	24,517	.05	0.528	0.004
EOTB Single Items				
13. Medical problems during training	20,094	.11	0.565	0.005
Level of strain, conflict or stress	19,943	-.10	0.565	0.005
35a. Fail physical requirements	19,966	.08	0.532	0.005
Important to complete enlistment	20,025	-.08	0.528	0.005
16. Get into serious trouble?	19,912	.06	0.515	0.005
Being away from family and friends	19,899	-.05	0.532	0.005
Advise male about joining Army	19,890	-.05	0.519	0.005

Table 7.5. (Continued)

Predictor	*n*	*r*	*c*	SE_c
EOTB Composites				
Physical Fitness	20,111	-.09	0.534	0.005
Possible Reasons for Leaving the Army - Problems Adjusting	19,994	.07	0.534	0.005
Perceived Fit with Army	20,044	-.07	0.534	0.005
Efficacy for Performance	19,990	-.07	0.540	0.005
Job Performance (self-rated)	20,047	-.07	0.546	0.005
Possible Reasons for Leaving Army - All Reasons	20,028	.06	0.543	0.005
Importance of Core Army Values - Loyalty and Selfless Service	20,007	-.05	0.519	0.005
Satisfaction with Army Life	20,129	-.05	0.527	0.005
Affective Commitment	20,111	-.05	0.526	0.005
EOTA Single Items				
16. Get into serious trouble?	16,266	.12	0.534	0.006
13. Medical problems during training	16,366	.11	0.567	0.005
51. Important to complete enlistment	16,341	-.11	0.552	0.006
36. Level of strain, conflict or stress (Reversed)	16,296	-.10	0.571	0.006
35a. Fail physical requirements	16,303	.08	0.532	0.005
25a. Relationships with peers	16,365	-.06	0.532	0.006
25h. Amount of personal freedom	16,270	-.06	0.542	0.006
30a. Combat flow of illegal drugs	16,312	-.06	0.538	0.006
40. Advise male about joining Army	16,199	-.06	0.531	0.006
17. Have you been sexually harassed?	16,284	.05	0.510	0.006
21a. Discrimination? No	16,331	-.05	0.517	0.006
14. Medical advice against exercise (reversed)	16,334	-.05	0.511	0.006
15c. Reluctant to leave for bit more	16,321	-.05	0.532	0.006
12. Health now compared to at entry	16,361	-.05	0.520	0.006
EOTA Composites				
Perceived Fit with Army	16,350	-.11	0.559	0.006
Reasons for Leaving the Army - Problems Adjusting	16,329	.10	0.556	0.006
Reasons for Leaving Army - All Reasons	16,359	.10	0.564	0.006
Efficacy for Performance	16,280	-.10	0.553	0.006
Job Performance (self-rated)	16,335	-.10	0.563	0.006
Affective Commitment	16,384	-.09	0.554	0.006
Satisfaction with Army Life	16,390	-.08	0.545	0.006
Importance of Core Army Values - Loyalty and Selfless Service	16,281	-.08	0.536	0.006
Physical Fitness	16,386	-.08	0.545	0.006
Importance of Core Army Values - Duty, Integrity, and Personal Courage	16,283	-.07	0.530	0.006
Incidents of Discrimination	16,359	.05	0.517	0.006
Satisfaction with Training	16,392	-.05	0.528	0.006
Satisfaction with Officers	16,381	-.05	0.530	0.005
Satisfaction with Supervision - Leader Support	16,367	-.05	0.533	0.006

Table 7.5. (Continued)

Predictor	*n*	*r*	*c*	*SEc*
AIM Composites				
Dependability	13,046	-.12	0.568	0.005
Physical Conditioning	13,066	-.09	0.553	0.005
Agreeableness	13,062	-.07	0.545	0.005
Work Orientation	13,057	-.06	0.538	0.005
Adjustment	13,050	-.06	0.536	0.006
Red Phase Composites				
APFT2 Total (push-ups+sit-ups+run)	1,721	-.10	0.564	0.017
APFT1 Total (push-ups+sit-ups+run)	1,847	-.09	0.557	0.016

Note. r = Point-biserial correlation or phi-coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r and c-statistics are significant ($p < .05$, one-tailed). Within each category, predictors are sorted in descending order by value of their correlation with the attrition criterion.

Comparison of Bivariate Relationships Across Types of Attrition

As in Chapter 3, the discussion of bivariate relations incorporates correlations adjusted to an attrition base rate of .50. The adjusted correlations between project variables and the six categories of unit attrition appear in Table 7.6. The variables presented in Table 7.6 are those having unadjusted correlations of at least .05 with one or more criterion variables.

Administrative Variables

Table 7.6 demonstrates that administrative variables relate differently to the various attrition criteria. As in the overall sample, Education Tier predicted Overall attrition quite well, but it related even more strongly to Moral Character attrition (and not at all to Medical/Physical attrition). Logistic regression analyses revealed the odds of Moral Character attrition for Tier 2 Soldiers were 2.73 times greater than the odds of such attrition for Tier 1 Soldiers. As was the case with overall attrition, we found that the odds of Moral Character attrition for Tier 3 Soldiers were not significantly higher than the odds of such attrition for Tier 1 Soldiers (*OR* = 1.39, *ns*). In contrast, the odds of Performance and Medical/Physical attrition for Tier 2 Soldiers were 1.91 and 1.31 times greater (respectively) than the odds of such attrition for Tier 1 Soldiers. Again, the odds of these types of attrition for Tier 3 Soldiers were not significantly different from those of Tier 1 Soldiers

The correlation between gender and the various attrition types is more constant across attrition types once Soldiers reach their units. As in the overall sample, however, the odds of Moral Character attrition for males were 1.82 times greater than the odds of such attrition for females. The relation between gender and Performance attrition remains, with the odds of attrition for performance reason being nearly twice as great for females (odds ratio = 1.70) as for males. Similar to education tier, the relation of gender with Medical/Physical attrition also wanes, with females' odds exceeding males' by a factor of 1.48.

Table 7.6. Adjusted Point-Biserial Correlations between Different Types of Attrition and Top Pre-Unit Predictors

Predictor	Type of Attrition					
	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
Administrative						
Education Tier	.12	.18	.09	.03	.06	.09
Gender	.11	.08	.08	.06	NA	.06
Pay Grade at Entry	.08	.11	.08	.04	.04	.03
Enlistment Term at Entry	.07	.06	.03	.07	.13	.07
Race/Ethnicity (W/B/H/O)	.07	.08	.07	.09	.12	.05
High Quality Recruit (HSG + Cat I-IIIa)	.07	.10	.06	.00	-.02	.02
AFQT Category	.06	.08	.06	.03	.02	.04
Medical Failure: Weight	.04	.00	.04	.12	-.02	.01
Medical Failure: Drugs	.04	.07	.00	.01	.01	.00
Enlistment Waiver	.03	.08	.02	.02	.03	.02
CMF Category	.03	.09	.09	.05	.10	.05
Moral Character Enlistment Waiver	.02	.06	.01	.01	-.02	.00
Marital Status at Entry (S/M)	.02	.01	.01	.00	.06	.04
MOS Category (CA,CS,CSS)	.02	.07	.06	.04	.07	.01
CDC BMI Category	.02	.03	.04	.16	.05	.00
SRS Single Items						
42. How often smoke before DEP?	.15	.20	.12	.07	.11	.07
25l. Other reasons (thought of quitting HS)	.10	.13	.10	.03	.06	.06
24. Were you ever suspended?	.10	.18	.06	.03	.03	.02
23. Were you ever expelled?	.09	.14	.08	.02	.02	.01
25j. Didn't get along with authorities	.08	.11	.07	.05	.01	.03
25d. Bored, not learning anything	.08	.10	.08	.05	.03	.05
25i. Wasn't going to graduate on time	.08	.10	.08	.04	.04	.03
25c. Expelled or suspended	.08	.11	.05	.03	.02	.04
25k. Wanted to work full time	.07	.09	.04	.04	.05	.06
25g. Didn't get along with students	.07	.08	.08	.07	.01	.04
57a. Fail physical requirements	.07	.01	.12	.13	.05	.03
02d. Wife/Husband/Girlfriend/Boyfriend	.06	.07	.03	.03	.09	.04
38e. Left job--fired	.06	.07	.06	.05	-.01	.02
25f. Getting bad grades	.05	.07	.04	.01	.04	.03
43. How often drink alcohol before DEP	.05	.09	.03	.01	.03	-.01
01u. Make Army a career	.05	.04	.02	.03	.05	.05
25e. Got married or became a parent	.04	.03	.04	.01	.06	.03
39. Moral waiver needed to join Army?	.03	.06	.02	-.01	-.05	.00
26a. Participated in Athletic teams	-.02	.02	-.09	-.03	-.02	-.01
57m. Better job outside the Army	-.02	-.02	-.03	.00	-.05	.00
21. College when enlistment term is up?	-.03	-.06	-.03	-.03	-.03	-.01
38l. Left job to join the military	-.05	-.08	-.03	-.01	.02	-.02
20. Average grades in high school	-.05	-.10	-.06	-.02	-.03	-.01
22a. Never sent to principal's office	-.08	-.14	-.04	-.03	-.02	-.01

Table 7.6. (Continued)

Predictor	Type of Attrition					
	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
35. Average fitness level before Army	-.07	-.01	-.13	-.12	-.06	.00
05. How long in DEP?	-.10	-.11	-.07	-.06	-.05	-.07
25a. Never thought about quitting HS	-.14	-.18	-.12	-.06	-.08	-.09
SRS Composites						
Thoughts of Quitting High School	.14	.18	.12	.07	.08	.08
Trouble in School	.13	.21	.11	.05	.06	.01
Reasons for Quitting Previous Jobs	.08	.08	.04	.08	.11	.05
Military vs. Civilian Life - Pay	.06	.06	.05	.03	.00	.00
Reasons for Joining Army - Escape Problems	.05	.09	.03	.01	-.01	.04
Continuance Intentions	.05	.05	.03	.03	.04	.04
Attrition Cognitions (Recoded + with Attrition Status)	.04	.02	.09	.04	.05	.05
Generalized Self Efficacy	-.04	.02	-.10	-.06	-.05	-.04
EOTB Single Items						
13. Medical problems during training	.12	.06	.12	.14	.09	.07
35a. Fail physical requirements	.09	.00	.22	.18	.03	.05
16. Get into serious trouble?	.07	.11	.05	.01	.04	.02
47. Girlfriend/boyfriend in your life?	.04	.03	.00	.02	.09	.04
35c. Family problems at home	.04	.04	.01	.01	.05	.01
15i. Rewarding career compensates	-.02	.01	.00	-.06	-.05	-.01
30a. Combat flow of illegal drugs	-.05	-.06	-.03	-.01	-.02	.01
25n. Being away from family and friends	-.05	-.03	-.05	-.06	-.08	-.02
40. Advise male about joining Army	-.05	-.06	-.07	-.06	.00	-.03
51. Important to complete enlistment	-.08	-.06	-.17	-.12	-.01	-.06
36. Level of strain, conflict or stress	-.10	-.06	-.11	-.14	-.09	-.06
EOTB Composites						
Possible Reasons for Leaving the Army - Problems Adjusting	.08	.08	.11	.10	.03	.04
Possible Reasons for Leaving Army - All Reasons	.07	.06	.08	.09	.01	.03
Satisfaction with Supervision - Leader Self-Promotion	.02	.06	.00	.02	-.01	.00
Satisfaction with Army Life	-.05	-.05	-.08	-.07	-.02	-.04
Affective Commitment	-.06	-.05	-.09	-.08	.00	-.04
Perceived Fit with Army	-.07	-.07	-.13	-.09	.02	-.02
Efficacy for Performance	-.08	-.02	-.18	-.13	-.01	-.03
Job Performance (self-rated)	-.08	-.05	-.12	-.09	-.05	-.01
Physical Fitness	-.10	.01	-.23	-.21	-.04	-.04
EOTA Single Items						
16. Get into serious trouble?	.14	.17	.24	.05	.09	.05
13. Medical problems during training	.12	.06	.15	.15	.14	.09
35a. Fail physical requirements	.09	.02	.35	.20	.01	.06
17. Have you been sexually harassed?	.06	.02	.01	.04	.08	.05
35h. Illness/medical condition	.05	.01	.08	.10	.01	.03
47. Girlfriend/boyfriend in your life?	.03	.02	.00	.00	.07	.03
24f. Most severe to Hispanics	.01	.03	.01	-.01	-.05	-.01
15i. Rewarding career compensates	-.03	.00	-.06	-.04	-.06	-.03
50. Going to college?	-.03	-.04	-.13	-.04	.00	-.02

Table 7.6. (Continued)

Predictor	Type of Attrition					
	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
25n. Being away from family and friends	-.04	-.01	-.01	-.07	**-.06**	-.05
29. Work I enjoy most is available	-.05	-.01	**-.12**	-.06	**-.06**	-.05
21a. Discrimination? No	**-.05**	-.03	-.09	-.06	**-.07**	-.02
15c. Reluctant to leave for bit more	**-.06**	-.03	-.08	-.08	**-.06**	-.07
12. Health now compared to at entry	**-.06**	.01	**-.13**	**-.11**	-.05	-.05
25a. Relationships with peers	**-.06**	-.04	**-.13**	**-.09**	-.02	-.05
25h. Amount of personal freedom	**-.07**	**-.06**	-.06	-.08	-.04	-.03
30a. Combat flow of illegal drugs	**-.07**	**-.09**	-.05	.01	.02	-.02
40. Advise male about joining Army	**-.07**	**-.07**	-.08	-.07	-.01	-.06
36. Level of strain, conflict or stress (Reversed)	**-.11**	**-.08**	**-.14**	**-.13**	**-.08**	-.06
51. Important to complete enlistment	**-.13**	**-.08**	**-.25**	**-.19**	**-.07**	**-.11**
EOTA Composites						
Reasons for Leaving the Army - Problems Adjusting	**.11**	**.09**	**.20**	**.12**	**.07**	**.09**
Reasons for Leaving Army - All Reasons	**.11**	**.09**	**.15**	**.11**	.05	**.08**
Incidents of Discrimination	**.05**	.04	.10	.07	**.06**	.03
Satisfaction with Supervision - Leader Self-Promotion	.03	**.06**	.01	.03	.00	.00
Military vs. Civilian Life - Job Characteristics	-.05	-.03	**-.12**	-.08	-.01	-.05
Satisfaction with Training	**-.06**	-.03	**-.15**	**-.11**	-.01	-.05
Satisfaction with Officers	**-.06**	**-.06**	-.10	-.07	.00	-.02
Satisfaction with Supervision - Leader Support	**-.06**	**-.07**	-.06	-.07	.02	-.03
Importance of Core Army Values - Duty, Integrity, and Personal Courage	**-.08**	**-.08**	**-.19**	-.07	-.04	-.04
Satisfaction with Army Life	**-.09**	-.05	**-.18**	**-.14**	-.02	-.08
Importance of Core Army Values - Loyalty and Selfless Service	**-.09**	**-.07**	**-.20**	**-.09**	-.02	-.06
Physical Fitness	**-.09**	-.01	**-.33**	**-.20**	**-.06**	-.03
Affective Commitment	**-.10**	**-.07**	**-.19**	**-.14**	.01	**-.08**
Efficacy for Performance	**-.11**	-.05	**-.28**	**-.18**	**-.08**	-.08
Job Performance (self-rated)	**-.11**	**-.10**	**-.24**	-.08	**-.07**	-.05
Perceived Fit with Army	**-.12**	**-.10**	**-.22**	**-.13**	**-.07**	**-.09**
AIM Composites						
Adjustment	**-.06**	**-.06**	**-.09**	**-.07**	.05	-.04
Work Orientation	**-.07**	**-.08**	**-.10**	-.07	-.04	.01
Agreeableness	**-.08**	**-.10**	**-.08**	-.04	.01	-.05
Physical Condition	**-.09**	**-.07**	**-.12**	**-.11**	-.03	-.02
Dependability	**-.12**	**-.18**	**-.09**	-.04	.00	-.06

Note. Values in cells are adjusted correlations (Kemery et al., 1988) and assume an attrition base rate of .50. Within each category, predictors are sorted in descending order by value of their correlation with Overall attrition. Correlations are highlighted if their *unadjusted* value is at least .05 in magnitude. Pregnancy/Parenthood correlations are based on females only.

By way of comparison with the overall sample analysis in Chapter 3, the high quality recruit variable (where a high quality recruit is a high school diploma holder who scores at or above average on the AFQT) again was most predictive of Moral Character and Performance attrition (setting Overall attrition aside), and its effects were relatively modest. The odds of Moral Character and Performance attrition for low quality recruits were 1.62 and 1.42 times greater (respectively) than the odds of such attrition for high quality recruits. Based on adjusted

point-biserial correlations, AFQT category was moderately predictive of all types of attrition, being slightly more predictive of Overall, Moral Character, and Performance attrition. Table 7.7 presents odds ratios for AFQT category relative to each type of attrition. Again, Soldiers with lower AFQT scores appear to be greater attrition risks across all categories (exception—Other attrition).

Regarding Pregnancy/Parenthood attrition, the relations in Table 7.6 (calculated on females only) indicate that enlistment term, race/ethnicity, and education are moderately related to this event. Relative to those with 4-year enlistment terms, females with shorter terms had lesser odds of this type of attrition (odd ratios of 5.00 and 1.45 for 2-year and 3-year terms, respectively). In contrast, the odds of females with 5-year terms attriting for pregnancy or parenthood were 1.78 those of females with 4-year terms. The effect of time in service did not follow lockstep, however, as females with 6-year terms have slightly lower odds of this type of attrition (odds ratio = 0.96, *ns*). Regarding race/ethnicity, whites were more likely than minorities to attrit because of pregnancy/parenthood. Specifically, relative to blacks, Hispanics, and other minorities, the odds for whites were 1.75, 1.32, and 1.68 times greater. Finally, females in Education Tiers 2 and 3 had greater odds of attriting for pregnancy/parenthood (1.63 and 1.55, respectively) than females with high school diplomas. Note, also, that BMI did not evidence as strong a relationship as when considering both male and female Soldiers. Nevertheless, the effect was significant for BMI categories. Relative to normal BMI females, those in the Underweight BMI category were slightly more likely to attrit for pregnancy/parenthood (odds ratio = 1.11, *ns*). Females in the Normal BMI category were significantly more likely than those in the Overweight and Obese categories to attrit for this reason (odds ratios of 1.20 and 2.28, respectively).

Lastly, a review of the other administrative variables in Table 7.6 reveals relations consistent with expectations. Moral character enlistment waiver and medical failure for drugs were related to Moral Character attrition but unrelated to other forms of attrition. Marital status and number of dependents at entry were related to Pregnancy/Parenthood attrition, but relatively unrelated to the other types of attrition (with the exception of Other attrition). Medical failure for weight and body mass index (BMI) category were related to Medical/Physical attrition but relatively unrelated to other forms of attrition.

Table 7.7. Odds Ratios for AFQT Category by Attrition Type

		Type of Attrition				
Predictor	Overall	Moral	Perform	Med/ Phys	Preg/ Parenthood	Other
AFQT Category (Cat I)						
Cat II	**1.48**	**1.64**	**1.58**	**1.38**	**1.48**	0.97
Cat IIIA	**1.89**	**2.26**	**2.03**	**1.50**	**1.89**	1.15
Cat IIIB	**1.72**	**2.19**	**1.98**	1.26	**1.72**	0.92
Cat IV and Lower	**1.47**	**1.56**	**2.69**	1.31	**1.47**	0.87

Note. Reference group is Category I Soldiers. Bolded values are statistically significant ($p < .05$).

Survey Variables

As with the administrative variables, items and composites from the various project surveys demonstrated differential correlations with the six attrition criteria. Again, these patterns followed expectations, with items indicating medical or physical problems correlating with Medical/Physical attrition, deviance and past withdrawal behaviors correlating with Moral Character attrition, and so on. Table 7.6 indicates that many survey variables provide useful relations with the attrition criteria. In the following sections, we highlight some of the more notable findings.

SRS

Somewhat surprisingly, several SRS variables related to unit attrition. Although most of these relations were with either Overall or Moral Character attrition, the finding that data collected at entry would still predict attrition several months to a few years later is noteworthy. For the most part, these variables reflect deviance behaviors (smoking before entering DEP, being suspended or expelled from school, not getting along with others—whether authority figures or peers) or withdrawal cognitions and behaviors (thoughts about quitting high school, quitting previous jobs, escaping problems). Variables on the opposite pole (never thinking about quitting high school, not being sent to the principal) demonstrate similarly strong negative correlations.

Few SRS variables related to Medical/Physical attrition from the unit. This might well be because much of the predictable medical/physical attrition occurs in IET. In addition, the relations between this attrition criterion and SRS composites assessing quitting behavior (Thoughts of Quitting High School, Reasons for Quitting Previous Jobs) might indicate coding expedience with regard to attrition. There is some evidence that the ISCs for attrition do not always reflect the true underlying reason for the attrition behavior in question (Sipes, Strickland, Laurence, DiFazio, & Wetzel, 2000). The pattern of correlations just discussed might occur when (a) Soldiers clearly want out of the Army and (b) their supervisors grant their wish by assigning them a Medical/Physical ISC rather than deal with their problematic behavior day after day.

EOTB

Although fewer EOTB variables than SRS variables appear in Table 7.6, the EOTB variables evidence more similar relations across the various attrition criteria. Also, although some EOTB variables predict Moral Character attrition (e.g., EOTB 16. Get into serious trouble, Possible Reasons for Leaving the Army - Problems Adjusting), the EOTB data seem in bulk to do a better job predicting Performance and Medical/Physical attrition. Physical fitness and efficacy for performance show rather strong correlations, in particular. In addition, EOTB 13 (medical problems during training) shows high correlations across the criteria. Its correlations with Moral Character attrition and Pregnancy/Parenthood are a bit unexpected, and perhaps this occurs through expedient ISC coding. Stress/strain also shows predictive power across the various criteria. (Note that the negative sign is due to the coding of this item—higher scores indicate lower stress. Hence, those experiencing more stress/strain are more likely to attrit for sundry reasons.)

EOTA

As the most proximal variables appearing in Table 7.6, the EOTA variables should show more and stronger correlations with the various attrition criteria, and this is indeed the case. As with the EOTB variables, EOTA 13 (medical problems during training) again shows strong relations across the various criteria. Indeed, it is one of the only measures predictive of Other attrition. Relative to the EOTB results, more items assessing satisfaction appear in the table (i.e., items 25a, 25h, 25n; composites Satisfaction with Training, Satisfaction with Officers, Satisfaction with Supervision - Leader Support). Two variables show even stronger relations than they did in the EOTB results: Efficacy for Performance and Perceived Fit with Army. Interestingly, items associated with attrition cognitions—item 09, which assesses the degree to which career commitment has changed during training; and item 31b, which assesses confidence in completing the term of obligation—do not appear in Table 7.6. Rather, EOTA item 51, which assesses the importance of completing the obligation, demonstrates moderate to strong correlations with the criteria (correlating most strongly with Performance and Medical/Physical attrition). The relative lack of attrition cognition variables will manifest itself again in the structural model for Overall attrition discussed later in this chapter.

AIM

The AIM composites demonstrate moderate correlations with Overall, Moral Character, and Performance attrition. As expected, the Physical Condition composite correlates nicely with Medical/Physical attrition. Unfortunately, the promising validity results obtained in research settings for AIM composites do not manifest themselves under recent operational use of the instrument (Knapp, Heggestad, & Young, 2004).

Assessing the Effects of Predictors Over Time

As in other chapters, we turn now to examine the degree to which the bivariate relations just presented vary over time. The data in Table 7.4 suggest that medical and physical variables might predict attrition early on but then decrease in predictive power, whereas deviance-related variables might well increase in predictive strength. In this section, we present data to address these hypotheses.

Parameterizing Time

As before, we constructed discrete-time hazard models to test for potential time-varying effects of each pre-unit variable. Once again, the first step involved the selection of an appropriate parameterization of time. Table 7.8 shows model fit statistics for different parameterizations of time we fitted to the data.

As before, we relied primarily on the PI statistics to identify the parameterization of time. The quintic polynomial parameterization accounted for more than 90% of the improvement in fit achieved by using the general model (relative to the constant), but the first piecewise model performed nearly as well. For both of these parameterizations, the BIC statistic was actually better (lower) than that of the general model (values exceeding 1.0). Because of the simpler parameterization of the piecewise models (i.e., no polynomial terms), we selected the first

piecewise parameterization of time. (See Appendix F for technical details on the parameterization of the EHA models.)

Table 7.8. Model Fit Statistics for Different Parameterizations of Time for Unit Attrition

Parameterization of Time	n_p	Deviance (-2LL)	vs. Previous Model Deviance	vs. General Model Deviance	AIC	BIC	Proportion Improvement (Constant-General)	
							PI (Deviance)	PI (BIC)
Polynomial								
Constant	1	167,383.04	-	1,347.26	167,385.04	167,393.96	-	-
Linear	2	167,201.55	181.49	1,165.77	167,205.55	167,223.38	0.13	0.19
Quadratic	3	167,200.02	1.53	1,164.24	167,206.02	167,232.77	0.14	0.18
Cubic	4	166,553.31	646.71	517.53	166,561.31	166,596.98	0.62	0.89
Quartic	5	166,184.31	369.00	148.53	166,194.31	166,238.90	0.89	1.28
Quintic	6	166,143.18	41.12	107.40	166,155.18	166,208.69	0.92	1.32
Piecewise								
PW1 (4D + 3C)	7	166,156.68	-	120.90	166,170.68	166,233.10	0.91	1.29
PW2 (4D + 1C)	4	166,532.24	-	496.46	166,540.24	166,575.91	0.63	0.91
General	42	166,035.78	-	-	166,119.78	166,494.30	1.00	1.00

Note.
PW1 = One dummy indicator for each of the first four months, then one indicator for months 5 through 11, one indicator for months 12 through 33, and one indicator for months 34 through 42.
PW2 = One dummy indicator for each of the first four months, then one indicator for months 5 through 42.

Testing for Time Varying Effects

Having selected an appropriate parameterization of time, we again estimated a hierarchical discrete-time hazard model for each predictor, assessing *if* and *how* its effect on attrition varied over time. Table 7.9 presents the fit statistics for variables that either (a) had an unadjusted point-biserial correlation with overall attrition (in the aggregate sample) of at least .05 in magnitude or (b) had a *c*-statistic in any month of service summarized in Table 7.10 that was at least .55 in magnitude (at least 10% greater than chance discrimination of attrits/non-attrits).

Table 7.9 shows deviance statistics associated with each step of the hierarchical EHA model for each predictor. Recall that in Step 1, the parameterization of time was entered; in Step 2, the predictor itself was entered; and in Step 3, interaction terms between the predictor and the time variables were entered (see Appendix F for details). Also shown in Table 7.9 are likelihood ratio test statistics indexing the increment in fit when Step 3 was added to the model (i.e., when the effect of the predictor was allowed to vary across time), and a statistic PI (-2LL) indexing the proportion of improvement in full model fit achieved when Step 3 was added to the model. Predictor variables were designated as having "time varying" effects in the first column of Table 7.9 if the likelihood ratio test of the increment in fit achieved by adding Step 3 was statistically significant.

Table 7.9. Model Fit Statistics for Assessing Time Varying Effects of Predictors of Unit Attrition

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 v. 3	PI (-2LL)
Administrative					
Time Varying					
Education Tier	165,239	164,508	164,486	22.3	3.0%
Gender	166,157	165,716	165,677	38.6	8.0%
Enlistment Term at Entry	165,495	165,441	165,327	114.1	67.7%
Race/Ethnicity (W/B/H/O)	166,157	165,925	165,855	69.3	23.0%
AFQT Category	165,852	165,673	165,628	44.5	19.8%
CMF Category	166,142	166,061	165,807	253.8	75.9%
MOS Category (CA,CS,CSS)	166,157	166,110	165,926	183.9	79.8%
Fixed					
Pay Grade at Entry	166,157	165,825	165,801	23.9	6.7%
High Quality Recruit (HSG + Cat I-IIIa)	166,157	165,873	165,867	6.3	2.2%
Survey Single Items					
Time Varying					
How often smoke before DEP?	74,393	73,924	73,905	19.5	4.0%
EOTA Get into serious trouble?	42,733	42,508	42,479	28.6	11.3%
EOTB Medical problems during training	58,624	58,383	58,363	19.7	7.5%
EOTA Medical problems during training	43,024	42,825	42,807	17.3	8.0%
EOTA Level of stress/strain	42,878	42,713	42,697	15.4	8.5%
EOTB Level of stress/strain	58,177	57,981	57,963	17.6	8.2%
Were you ever suspended?	60,276	60,087	60,067	19.9	9.5%
Were you ever expelled?	60,263	60,139	60,118	20.8	14.3%
Level of stress/strain	74,453	74,408	74,388	20.3	31.3%
EOTB Relationships with peers	58,631	58,597	58,584	13.6	28.5%
EOTA Work I enjoy most is available	35,139	35,106	35,074	31.7	48.5%
EOTA Your personal and family life	42,590	42,556	42,535	21.1	38.5%
APFT1 Push-ups	5,166	5,162	5,148	14.6	78.3%
Average grades in high school	73,899	73,835	73,821	14.1	18.1%
EOTA Medical advice against exercise (R)	42,913	42,876	42,860	16.1	30.0%
EOTB Advise male about joining Army	57,941	57,884	57,866	17.8	23.8%
EOTA Reluctant to leave for bit more	42,953	42,903	42,883	20.6	29.2%
EOTA Health now compared to at entry	43,032	42,990	42,948	42.2	50.1%
EOTA Relationships with peers	43,042	42,989	42,975	14.6	21.6%
EOTA Advise male about joining Army	42,640	42,569	42,547	21.6	23.2%
Average fitness level before Army	74,545	74,443	74,401	42.0	29.2%
Never sent to principal's office	73,538	73,409	73,390	18.4	12.4%
EOTB Important to complete enlistment	58,459	58,325	58,253	71.5	34.6%
APFT1 Run	5,070	5,058	5,041	16.7	57.8%
EOTA Important to complete enlistment	42,942	42,719	42,617	101.3	31.2%
APFT2 Run	4,776	4,750	4,727	22.6	47.0%
Never thought about quitting HS	73,172	72,743	72,728	14.6	3.3%

Table 7.9. (Continued)

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 v. 3	PI (-2LL)
Fixed					
EOTA Get into serious trouble?	58,125	58,060	58,057	3.1	4.6%
Wife/Husband/Girlfriend/Boyfriend	71,103	71,033	71,027	6.6	8.7%
EOTA Have you been sexually harassed?	42,777	42,743	42,734	8.4	19.7%
EOTA Army people help when needed	42,792	42,763	42,751	12.2	29.5%
EOTA Barracks living	42,959	42,932	42,921	11.5	29.6%
EOTA Discrimination? No	42,916	42,887	42,880	6.9	19.2%
EOTB Being away from family and friends	58,003	57,954	57,942	12.3	20.1%
EOTA Amount of personal freedom	42,821	42,763	42,751	11.9	17.0%
EOTA Combat flow of illegal drugs	42,890	42,830	42,826	3.3	5.1%
APFT2 Sit-ups	4,801	4,788	4,779	8.5	38.8%
APFT1 Sit-ups	5,176	5,161	5,151	10.2	40.5%
How long in DEP?:How long in DEP?	73,829	73,640	73,630	9.8	4.9%
Survey Composites					
Time Varying					
SRS Trouble in School	73,538	73,214	73,196	17.8	5.2%
EOTA Reasons for Leaving - Problems Adjusting	42,868	42,687	42,646	41.0	18.5%
EOTA Reasons for Leaving - All Reasons	43,020	42,856	42,825	30.4	15.6%
EOTB Reasons for Leaving - Problems Adjusting	58,355	58,247	58,226	21.5	16.6%
EOTB Reasons for Leaving - All Reasons	58,442	58,363	58,344	19.9	20.2%
SRS Military vs. Civilian Life - Pay	73,116	73,050	73,037	13.3	16.8%
EOTA Reasons for Leaving - Medical Issues	42,787	42,755	42,726	28.8	47.2%
EOTB Reasons for Leaving - Medical Issues	58,230	58,194	58,178	16.3	31.4%
SRS Attrition Cognitions	74,687	74,628	74,588	40.3	40.6%
EOTB Military vs. Civilian Life - Pay	57,347	57,324	57,302	22.3	49.8%
SRS Reasons for Leaving Army - All Reasons	74,504	74,470	74,451	19.0	35.9%
EOTA Satisfaction with Supervision - Leader Self-Promotion	43,163	43,147	43,129	17.4	52.0%
EOTB Continuance Intentions	58,758	**58,757**	58,739	18.2	94.0%
EOTB Military vs. Civilian Life - Time for Personal Life	57,089	**57,088**	57,067	21.3	96.6%
EOTB Military vs. Civilian Life - Benefits	56,572	**56,571**	56,555	16.3	96.5%
EOTA Continuance Intentions	43,115	43,109	43,048	61.0	91.5%
EOTB Military vs. Civilian Life - Job Characteristics	58,301	**58,299**	58,268	30.7	92.9%
SRS Reasons for Joining Army - Training and Experience	74,419	**74,416**	74,395	20.7	86.5%
EOTB Satisfaction with Work-Family Balance	58,700	58,697	58,676	21.5	88.5%
EOTB Satisfaction with Officers	58,702	58,697	58,683	14.1	74.3%
AIM: Social Desirability	44,826	44,821	44,804	17.0	80.1%
EOTB Satisfaction with Training	58,758	58,743	58,718	24.9	63.0%
EOTA Military vs. Civilian Life - Time for Personal Life	42,338	42,329	42,315	13.3	59.1%
EOTA Satisfaction with Work-Family Balance	43,061	43,038	43,012	26.3	53.8%
EOTA Military vs. Civilian Life - Overall	42,872	42,846	42,818	27.1	50.9%
SRS Generalized Self Efficacy	74,609	74,559	74,511	48.7	49.6%
EOTA Military vs. Civilian - Job Characteristics	42,758	42,716	42,681	35.4	45.9%
EOTB Core Army Values - Loyalty, Selfless Service	58,393	58,337	58,322	15.0	21.3%

Table 7.9. (Continued)

Predictor	Deviance (-2LL) Intercept Only (Step 1)	Fixed Effect (Step 2)	Time Varying Effect (Step 3)	*G* Step 2 v. 3	PI (-2LL)
EOTB Satisfaction with Army Life	58,758	58,696	58,653	43.1	40.9%
EOTA Satisfaction with Training	43,115	43,066	43,010	56.0	53.5%
EOTA Satisfaction with Officers	43,080	43,033	43,019	13.6	22.3%
EOTB Affective Commitment	58,700	58,631	58,606	24.5	26.1%
EOTB Perceived Fit with Army	58,452	58,349	58,325	24.2	19.1%
EOTA Core Army Values – Duty, Integrity, Courage	42,849	42,757	42,723	33.7	26.7%
EOTB Efficacy for Performance	58,366	58,246	58,190	55.3	31.5%
EOTB Job Performance (self-rated)	58,522	58,402	58,387	15.1	11.2%
EOTA Satisfaction with Army Life	43,114	42,997	42,934	63.3	35.2%
EOTA Core Army Values - Loyalty, Selfless Service	42,849	42,727	42,681	46.2	27.4%
EOTA Physical Fitness	43,112	42,992	42,867	124.6	50.9%
EOTA Affective Commitment	43,082	42,932	42,866	66.0	30.6%
APFT1 Total (push-ups+sit-ups+run)	5,045	5,030	5,014	15.8	50.3%
EOTB Physical Fitness	58,682	58,505	58,442	63.0	26.3%
APFT2 Total (push-ups+sit-ups+run)	4,680	4,663	4,648	14.4	45.1%
EOTA Efficacy for Performance	42,800	42,603	42,463	140.9	41.8%
EOTA Job Performance (self-rated)	42,941	42,756	42,720	35.9	16.2%
EOTA Perceived Fit with Army	42,977	42,769	42,713	55.9	21.2%
Fixed					
SRS Thoughts of Quitting High School	73,172	72,798	72,790	7.9	2.1%
SRS Reasons for Quitting Previous Jobs	74,126	74,001	73,996	4.5	3.5%
SRS Reasons for Joining Army - Escape Problems	74,377	74,310	74,304	6.1	8.4%
EOTA Incidents of Discrimination	42,916	42,883	42,878	4.7	12.4%
SRS Continuance Intentions	74,687	74,661	74,655	6.4	19.9%
SRS Reasons for Leaving Army - Problems Adjusting	74,145	74,112	74,101	10.9	25.1%
Fitness Score (APFT2 - APFT1)	4,449	**4,449**	4,442	6.6	97.5%
EOTA Military vs. Civilian Life - Benefits	41,455	41,447	41,442	4.8	38.6%
EOTB Satisfaction with Supervision - Leader Support	58,665	58,646	58,641	5.4	22.6%
EOTB Core Army Values – Duty, Integrity, Courage	58,403	58,376	58,364	12.3	31.8%
BCT Ratings of Motivation and Discipline	5,318	**5,315**	5,309	6.2	69.2%
BCT Ratings of Army Values, Motivation, and Discipline	5,331	**5,328**	5,321	6.6	67.4%
EOTA Satisfaction with Supervision - Leader Support	43,052	43,005	42,994	11.0	18.9%
AIM: Adjustment	44,822	44,765	44,755	9.6	14.4%
AIM: Work Orientation	44,860	44,794	44,784	9.7	12.8%
AIM: Agreeableness	44,878	44,804	44,796	8.0	9.8%
AIM: Physical Condition	44,845	44,743	44,737	6.2	5.8%
AIM: Dependability	44,797	44,599	44,594	4.8	2.4%

Note. Within each grouping, predictors are sorted in descending order of their point-biserial correlation with *overall* attrition. Bolded -2LL values under Step 2 indicate the main effect of the predictor (across time) was *not* statistically significant. PI(-2LL) = Proportion of change in -2LL between Steps 1 and 3 accounted for when the predictor's effect was allowed to vary across time (i.e., the percentage improvement in full model fit when Step 3 was added to the model). (R) = Reverse coding.

As in previous chapters, Table 7.9 shows that the vast majority of pre-training variables had effects on attrition that significantly varied across time in unit. Again, we must turn to other indices to investigate the direction and magnitude of the time-varying effects. To assess magnitude of the effect it is useful to review the *G* statistics reported in Table 7.9, as well as the *c*-statistics reported in Table 7.10. The following sections briefly discuss the strongest time-varying effects for administrative and survey variables.

Time-Varying Effects among Administrative Variables

The administrative variables exhibiting the largest time-varying effects were gender and the variables designating the job the Soldier has (MOS, CMF category). Referring to Table 7.10, the pattern of *c*-statistics across months of service for the variable Gender indicates that it discriminated between attritees and stayers best in the fifth to eleventh months of service (c = .558). Relating this result to the data in Table 7.4, it seems safe to surmise that the variable acts primarily through its prediction of attrition for pregnancy and parenthood. In contrast, the MOS and CMF variables discriminate best in the first three months Soldiers are in their units (c ranging from .566-.579 for MOS and .571-.594 for CMF category).

Recall that the *G*- and *c*-statistics speak to the magnitude but not the *direction* of the time-varying effect. Table 7.11 provides odds ratios for each of the administrative variables shown in Tables 7.9 and 7.10. For gender, the odds ratios show that females have a higher attrition rate at all points in unit but that the effect is much larger in months 4 through 11. The results for MOS category show that the effect lies almost entirely within the first 3 months in unit, during which the Combat Arms specialties evidence nearly twice the odds of attrition as Combat Support and Combat Service Support specialties. After the fourth month, the effect all but disappears. Regarding CMF category, we see the same effect, with Combat Operations exhibiting nearly twice the odds of attrition as the Administrative CMF. It should be noted that some of the effects from month 4 onward might be due to the differential assignment of females to the CMF categories.

Time-Varying Effects among Survey Variables

Based on the *G* statistics reported in Table 7.9, the survey variables with effects that varied most over time were EOT[47] item 51 (importance of completing one's enlistment), EOT 12 (current health compared to that at entry), SRS 35 (average fitness level before joining the Army), EOTA Generalized Self Efficacy, EOT Physical Fitness, EOTA Affective Commitment, and EOTA Satisfaction with Army Life. The *c*-statistics shown in Table 7.10 indicate the somewhat surprising result that the importance of completing one's enlistment discriminates between attritees and stayers best in the first 3 months in unit. One might imagine that this sentiment would continue to increase during one's time in unit. This finding suggests that those who do not value completing their enlistment term tend to leave shortly after their unit assignment. Later attrition seems to be due to other factors.

More in line with expectations, the two items assessing health and fitness discriminate best in the first 4 months of service in unit. The composite appears a bit more robust, continuing

[47] When the effects of the variable from both EOT administrations vary across time, the variable is denoted simply as EOT. Hence, both EOTB item 51 and EOTA item 51 have large *G* statistics in the table.

to discriminate well during the latter half of the first year in unit (months 5 to 11). Similarly, the three attitudinal variables (Generalized Self Efficacy, Affective Commitment, Satisfaction with Army Life) predict most strongly early on, with their capacity for discrimination waning after the first year. Indeed, only a few variables evidence more sizable *c*-statistics in the second year onward. They tend to involve physical/medical issues (e.g., APFT scores from the Red Phase of Basic Training, Medical Problems during Training) and deviant behaviors (smoking before DEP, Thoughts of Quitting High School, SRS Trouble in School). Time in DEP and the current level of stress/strain also predict attrition rather well at this more distant point in time. Several of these variables were collected prior to AIT, and some actually increased in discriminability over time. As discussed earlier in Chapter 3, the increased relation between variables assessing pre-service histories of deviance and unit attrition over time follows from findings presented earlier in this chapter—namely, that Moral Character attrition becomes the primary type of unit attrition after the fourth month.

The odds ratios in Table 7.12 indicate that the direction of the variables matches expectations. Specifically, medical problems, deviant behaviors, less satisfaction and affective commitment, and greater amounts of stress/strain lead to increased odds of attrition. In addition, the more proximal versions of the variables are more predictive. For example, consider Generalized Self Efficacy—the odds ratios for the EOTB composite in the first three months are 0.66, 0.70, and 0.77, whereas the values for the EOTA composite are 0.39, 0.44, and 0.55.

Multivariate Regression Models of Unit Attrition

Having examined the bivariate relations among the attrition criteria and the survey data, as well as examining those relations across time, we now turn to combining those variables into multivariate regression models. We generated two types of prediction models for each set of survey data for each attrition criterion: (a) a "maximum prediction" model (termed model "A"), in which we include any variables that demonstrate strong predictive relations, even though the Army would not use some of them operationally (e.g., gender, race/ethnicity); and (b) an "operational prediction" model (termed model "B"), which excludes the primary variables the Army would not employ during operational selection. Thus, there are six empirically derived prediction models per criterion: three "A" models and three "B" models (one for each of the three surveys—SRS, EOTB, and EOTA). Note, however, that the Army might choose not to use some of the predictors that remain in the operational prediction model (e.g., SRS 42. How often did you smoke before DEP?).

The analytic procedure was similar to the procedure used in Chapter 3. In short, we entered all potential variables from a given survey (SRS, EOTB, EOTA) into a backward elimination stepwise regression procedure for each criterion variable. Variables were retained as long as their *p*-values were $\leq .10$. The model was then refined to include only those variables with $p \leq .05$. This procedure resulted in a slightly larger sample size being retained. As such, the *p* values for other previously significant variables might now have become non-significant. Thus, variables were deleted one by one until a final model was obtained in which all predictors were significant at $p < .05$. Table 7.13 lists by criterion the variables that appeared in either the A model, the B model, or both models.

Table 7.10. c-statistics by Month in Unit for EHA Models of Unit Attrition

Predictor	*Wgt M c*	*SD*	*c*	1st Month *c*	2nd Month *c*	3rd Month *c*	4th Month *c*	5th-11th Month Ave. *c*	12th-33th Month Ave. *c*	34th-42nd Month Ave. *c*
Administrative										
Time Varying										
Education Tier	.538	.018	.535	.542	.524	.519	.541	.542	.509	
Gender	.534	.022	.530	.532	.518	.547	.558	.528	.549	
Enlistment Term at Entry	.509	.017	.516	.519	.515	.528	.520	.502	.508	
Race/Ethnicity (W/B/H/O)	.530	.022	.553	.536	.546	.532	.519	.530	.538	
AFQT Category	.530	.022	.532	.541	.537	.525	.530	.528	.543	
CMF Category	.530	.025	.594	.581	.571	.533	.527	.513	.534	
MOS Category (CA,CS,CSS)	.520	.030	.579	.569	.566	.511	.514	.506	.530	
Fixed										
Pay Grade at Entry	.534	.014	.545	.548	.531	.521	.525	.535	.531	
High Quality Recruit (HSG + Cat I-IIIa)	.535	.018	.531	.545	.520	.533	.529	.538	.533	
Survey Single Items										
Time Varying										
How often smoke before DEP?	.566	.032	.554	.574	.570	.534	.544	.574	.548	
EOTA Get into serious trouble?	.542	.030	.650	.585	.574	.507	.533	.527	.519	
EOTB Medical problems during training	.557	.033	.594	.569	.601	.571	.564	.544	.560	
EOTA Medical problems during training	.566	.037	.592	.620	.638	.570	.562	.554	.546	
EOTA Level of stress/strain	.573	.033	.642	.611	.625	.600	.581	.554	.556	
EOTB Level of stress/strain	.560	.045	.616	.583	.577	.580	.566	.548	.540	
Were you ever suspended?	.547	.027	.519	.520	.551	.514	.529	.557	.561	
Were you ever expelled?	.519	.016	.505	.503	.532	.500	.511	.523	.533	
Level of stress/strain	.525	.032	.568	.544	.557	.528	.526	.516	.503	
EOTB Relationships with peers	.523	.028	.551	.539	.552	.549	.521	.517	.511	
EOTA Work I enjoy most is available	.545	.050	.627	.608	.627	.586	.557	.522	.511	
EOTA Your personal and family life	.540	.039	.634	.607	.544	.506	.557	.521	.520	
APFT1 Push-ups	.527	.126	.553	.616	.587	.653	.535	.500	.600	
Average grades in high school	.526	.024	.513	.523	.513	.516	.500	.535	.529	
EOTA Medical advise against exercise (R)	.512	.017	.507	.542	.541	.504	.520	.506	.508	
EOTB Advise male about joining Army	.519	.020	.570	.528	.519	.521	.524	.511	.515	
EOTA Reluctant to leave for bit more	.542	.038	.608	.628	.555	.590	.540	.523	.532	

Table 7.10. (Continued)

Predictor	*Wgt M c*	*SD c*	1st Month *c*	2nd Month *c*	3rd Month *c*	4th Month *c*	5th-11th Month Ave. *c*	12th-33th Month Ave. *c*	34th-42nd Month Ave. *c*
EOTA Health now compared to at entry	.532	.039	.623	.605	.533	.577	.535	.512	.516
EOTA Relationships with peers	.536	.032	.617	.605	.512	.521	.524	.524	.540
EOTA Advise male about joining Army	.540	.037	.614	.622	.549	.550	.542	.523	.514
Average fitness level before Army	.534	.030	.559	.577	.576	.603	.528	.521	.540
Never sent to principal's office	.533	.022	.529	.520	.504	.508	.521	.541	.538
EOTB Important to complete enlistment	.530	.035	.620	.558	.558	.554	.548	.510	.502
APFT1 Run	.547	.097	.606	.545	.605	.826	.559	.519	.527
EOTA Important to complete enlistment	.571	.059	.757	.680	.651	.647	.584	.532	.501
APFT2 Run	.570	.109	.552	.728	.624	.810	.580	.538	.567
Never thought about quitting HS	.559	.024	.562	.564	.560	.513	.557	.564	.529
Fixed									
EOTB Get into serious trouble?	.512	.011	.505	.515	.512	.497	.513	.514	.509
Wife/Husband/Girlfriend/Boyfriend	.521	.022	.521	.507	.501	.530	.523	.525	.508
EOTA Have you been sexually harassed?	.508	.013	.488	.518	.520	.516	.512	.507	.513
EOTA Army people help when needed	.530	.045	.602	.568	.546	.481	.521	.524	.510
EOTA Barracks living	.527	.030	.544	.548	.516	.620	.520	.521	.513
EOTA Discrimination? No	.517	.020	.531	.509	.564	.500	.518	.514	.513
EOTB Being away from family and friends	.532	.032	.589	.558	.525	.531	.525	.527	.517
EOTA Amount of personal freedom	.545	.036	.584	.620	.568	.575	.533	.533	.542
EOTA Combat flow of illegal drugs	.533	.031	.514	.566	.510	.504	.531	.533	.551
APFT2 Sit-ups	.556	.122	.535	.586	.561	.707	.638	.522	.562
APFT1 Sit-ups	.553	.113	.604	.555	.585	.642	.608	.514	.637
How long in DEP?	.548	.029	.570	.545	.522	.547	.556	.550	.522
Survey Composites									
Time Varying									
SRS Trouble in School	.559	.028	.545	.553	.535	.501	.542	.569	.558
EOTA Reasons for Leaving - Problems Adjusting	.570	.052	.691	.679	.588	.605	.581	.544	.524
EOTA Reasons for Leaving - All Reasons	.576	.052	.670	.688	.620	.608	.596	.548	.526
EOTB Reasons for Leaving - Problems Adjusting	.534	.028	.583	.564	.572	.536	.543	.521	.523
EOTB Reasons for Leaving - All Reasons	.541	.030	.591	.569	.582	.539	.555	.527	.528
SRS Military vs. Civilian Life - Pay	.532	.027	.504	.553	.514	.537	.526	.538	.531

Table 7.10. (Continued)

Predictor	*Wgt M c*	*SD c*	1st Month *c*	2nd Month *c*	3rd Month *c*	4th Month *c*	5th-11th Month Ave. *c*	12th-33th Month Ave. *c*	34th-42nd Month Ave. *c*
EOTA Reasons for Leaving the Army - Medical Issues	.533	.044	.631	.608	.529	.522	.549	.512	.512
EOTB Reasons for Leaving - Medical Issues	.523	.030	.549	.554	.560	.529	.534	.511	.519
SRS Attrition Cognitions	.518	.024	.556	.554	.550	.559	.524	.503	.512
EOTB Military vs. Civilian Life - Pay	.526	.039	.564	.516	.517	.504	.520	.527	.556
SRS Reasons for Leaving Army - All Reasons	.519	.028	.531	.550	.570	.549	.535	.505	.522
EOTA Satisfaction with Supervision - Leader Self-Promotion	.530	.030	.583	.550	.522	.526	.531	.521	.538
EOTB Continuance Intentions	.515	.034	.576	.533	.526	.521	.500	.510	.507
EOTB Military vs. Civilian Life - Time for Personal Life	.514	.031	.587	.532	.533	.509	.502	.507	.509
EOTB Military vs. Civilian Life - Benefits	.515	.029	.559	.510	.547	.544	.495	.514	.511
EOTA Continuance Intentions	.540	.058	.722	.660	.583	.622	.537	.503	.530
EOTB Military vs. Civilian Life - Job Characteristics	.515	.034	.594	.542	.493	.518	.501	.511	.494
SRS Reasons for Joining Army - Training and Experience	.509	.030	.532	.552	.546	.507	.500	.503	.507
EOTB Satisfaction with Work-Family Balance	.508	.034	.578	.519	.499	.531	.505	.496	.516
EOTB Satisfaction with Officers	.509	.030	.561	.509	.534	.508	.495	.504	.522
AIM: Social Desirability	.518	.041	.504	.538	.519	.563	.511	.515	.516
EOTB Satisfaction with Training	.515	.035	.573	.554	.528	.541	.512	.502	.504
EOTA Military vs. Civilian Life - Time for Personal Life	.530	.038	.585	.602	.570	.565	.537	.511	.518
EOTA Satisfaction with Work-Family Balance	.532	.046	.653	.589	.532	.578	.536	.511	.513
EOTA Military vs. Civilian Life - Overall	.534	.052	.636	.633	.551	.566	.537	.510	.504
SRS Generalized Self Efficacy	.517	.029	.551	.577	.570	.569	.518	.500	.508
EOTA Military vs. Civilian Life - Job Characteristics	.541	.061	.667	.660	.554	.570	.541	.515	.502
EOTB Core Army Values - Loyalty, Selfless Service	.519	.030	.561	.515	.522	.546	.533	.508	.522
EOTB Satisfaction with Army Life	.529	.035	.625	.552	.504	.550	.530	.515	.512
EOTA Satisfaction with Training	.545	.049	.717	.649	.565	.556	.545	.519	.501
EOTA Satisfaction with Officers	.536	.037	.601	.604	.544	.539	.522	.524	.519
EOTB Affective Commitment	.528	.033	.601	.536	.554	.548	.527	.515	.526
EOTB Perceived Fit with Army	.534	.028	.588	.543	.543	.560	.548	.522	.539
EOTA Core Army Values - Duty, Integrity, Courage	.543	.045	.650	.675	.510	.557	.549	.518	.525
EOTB Efficacy for Performance	.542	.038	.620	.614	.578	.569	.551	.522	.517
EOTB Job Performance (self-rated)	.543	.035	.571	.559	.568	.561	.553	.537	.511
EOTA Satisfaction with Army Life	.561	.063	.734	.644	.644	.614	.561	.528	.512

Table 7.10. (Continued)

Predictor	*Wgt M c*	*SD c*	1st Month *c*	2nd Month *c*	3rd Month *c*	4th Month *c*	5th-11th Month Ave. *c*	12th-33th Month Ave. *c*	34th-42nd Month Ave. *c*
EOTA Core Army Values - Loyalty, Selfless Service	.551	.047	.680	.650	.549	.585	.563	.524	.513
EOTA Physical Fitness	.561	.056	.680	.700	.672	.651	.566	.524	.505
EOTA Affective Commitment	.572	.061	.742	.707	.620	.596	.563	.543	.509
APFT1 Total (push-ups+sit-ups+run)	.552	.112	.616	.590	.529	.769	.581	.514	.609
EOTB Physical Fitness	.551	.041	.588	.636	.601	.607	.558	.533	.524
APFT2 Total (push-ups+sit-ups+run)	.561	.120	.565	.676	.570	.747	.607	.525	.561
EOTA Efficacy for Performance	.579	.069	.777	.745	.662	.654	.577	.535	.524
EOTA Job Performance (self-rated)	.571	.049	.637	.676	.586	.598	.576	.552	.531
EOTA Perceived Fit with Army	.573	.050	.729	.687	.611	.608	.552	.546	.543
Fixed									
SRS Thoughts of Quitting High School	.562	.024	.563	.569	.560	.513	.562	.568	.533
SRS Reasons for Quitting Previous Jobs	.537	.026	.538	.509	.518	.525	.538	.540	.543
SRS Reasons for Joining Army - Escape Problems	.529	.027	.521	.525	.505	.500	.540	.529	.540
EOTA Incidents of Discrimination	.517	.019	.541	.508	.562	.499	.517	.513	.517
SRS Continuance Intentions	.515	.024	.489	.497	.494	.501	.519	.520	.522
SRS Reasons for Leaving Army - Problems Adjusting	.518	.026	.530	.537	.552	.547	.518	.510	.511
Fitness Score (APFT2 - APFT1)	.507	.137	.451	.678	.481	.536	.511	.510	.384
EOTA Military vs. Civilian Life - Benefits	.513	.042	.589	.521	.535	.510	.502	.506	.482
EOTB Satisfaction with Supervision - Leader Support	.518	.035	.561	.520	.518	.494	.516	.514	.510
EOTB Core Army Values - Duty, Integrity, Courage	.513	.036	.580	.523	.502	.544	.515	.502	.515
BCT Ratings of Motivation and Discipline	.521	.111	.522	.588	.587	.596	.568	.489	.511
BCT Ratings of Army Values, Motivation, and Discipline	.521	.116	.521	.587	.585	.599	.566	.490	.502
EOTA Satisfaction with Supervision - Leader Support	.539	.042	.605	.619	.541	.506	.532	.528	.504
AIM: Adjustment	.533	.026	.541	.565	.579	.539	.528	.526	.534
AIM: Work Orientation	.536	.041	.559	.549	.573	.545	.521	.528	.567
AIM: Agreeableness	.539	.030	.528	.538	.592	.523	.526	.537	.560
AIM: Physical Condition	.545	.028	.558	.560	.568	.539	.549	.539	.552
AIM: Dependability	.561	.030	.544	.556	.564	.514	.556	.566	.553

Note. Within each grouping, predictors are sorted in descending order of their point-biserial correlation with overall unit attrition. c-values that exceed .550 are highlighted. (R) = Reverse coding.

Table 7.11. Odds Ratios for Administrative Variables by Month in Unit for EHA Models of Unit Attrition

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Month 5-11	*OR* Month 12-33	*OR* Month 34-42
Time Varying							
Education Tier (Tier 1)							
Tier 2	**1.72**	**1.88**	**1.48**	**1.38**	**1.88**	**1.99**	**1.43**
Tier 3	1.23	0.88	0.78	1.16	1.23	1.31	1.02
Gender (Male)	**1.44**	**1.48**	**1.25**	**1.75**	**1.96**	**1.44**	**1.64**
Enlistment Term at Entry (4 Yr)							
2 Yr	0.67	0.62	0.71	0.63	**0.52**	**0.54**	
3 Yr	**1.23**	**1.24**	1.15	1.08	1.01	1.01	
5 Yr	0.73	0.76	0.99	**1.65**	**1.52**	1.00	0.98
6 Yr	**0.56**	**0.67**	0.76	**1.61**	**1.31**	1.00	1.14
Race/Ethnicity (White)							
Black	**0.63**	**0.76**	**0.77**	0.82	0.95	1.02	**1.20**
Hispanic	**0.66**	**0.75**	**0.58**	0.74	**0.78**	**0.64**	0.84
Other	**0.59**	**0.67**	**0.65**	0.68	**0.79**	**0.70**	0.82
AFQT Category (Cat I)							
Cat II	1.29	**1.75**	1.22	**2.29**	**1.36**	**1.41**	1.27
Cat IIIA	**1.61**	**2.24**	1.68	2.17	**1.74**	**1.73**	**1.53**
Cat IIIB	1.41	**2.03**	1.48	**2.40**	**1.49**	**1.69**	**1.65**
Cat IV or Lower	**2.06**	**3.38**	1.58	**3.19**	**1.50**	**1.31**	1.09
CMF Category (Administrative)							
Intelligence	0.69	0.84	**1.84**	0.53	0.84	0.90	0.80
Combat Operations	**1.97**	**2.05**	**1.85**	**0.71**	0.91	**1.13**	1.01
Logistics	1.03	**1.32**	1.07	0.79	1.01	**1.09**	**1.21**
Civil & Public Affairs	1.06	1.02	1.07	0.93	**1.57**	**1.20**	1.14
Communications	0.75	0.96	1.05	0.80	1.11	1.04	0.79
MOS Category (Combat Arms)							
Combat Support	**0.51**	**0.54**	**0.68**	0.95	**1.13**	0.95	0.94
Combat Service Support	**0.53**	**0.59**	**0.56**	1.06	1.10	0.95	1.15
Unknown	**0.21**	1.15	0.51	1.07	0.94	**0.72**	1.03
Fixed							
Pay Grade at Entry (E0/E1)							
E2	**0.81**						
E3	**0.69**						
E4 or Above	**0.53**						
High Quality Recruit (Low Quality)	**0.75**						

Note. [a] If no odds ratios are listed beyond the 1st month for a given predictor, the odds ratio listed under the first month indicates that the effect of the predictor did not significantly vary across time—the OR presented reflects the main effect for that predictor across all months in unit.
Within each grouping, predictors are sorted in descending order of their point-biserial correlation with overall unit attrition. Odds ratios that are statistically significant ($p < .05$) appear in boldface.

Table 7.12. Odds Ratios for Survey Variables by Month in Unit for EHA Models of Unit Attrition

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Months 5-11	*OR* Months 12-33	*OR* Months 34-42
Survey Single Items							
Time Varying							
How often smoke before DEP? (Never/Rarely)	**1.55**	**1.82**	**1.76**	1.33	**1.43**	**1.86**	**1.57**
EOTA Get into serious trouble?	**1.53**	**1.40**	**1.38**	1.13	**1.20**	**1.20**	**1.21**
EOTB Medical problems during training (No)	**2.18**	**1.76**	**2.33**	**1.79**	**1.70**	**1.43**	**1.61**
EOTA Medical problems during training (No)	**2.18**	**2.87**	**3.51**	**1.78**	**1.62**	**1.56**	**1.48**
EOTA Level of strain, conflict or stress (reversed)	**0.57**	**0.67**	**0.64**	**0.68**	**0.75**	**0.83**	**0.79**
EOTB Level of strain, conflict or stress (reversed)	**0.64**	**0.74**	**0.76**	**0.74**	**0.79**	**0.84**	**0.86**
Were you ever suspended? (No)	1.16	1.18	**1.51**	1.12	**1.27**	**1.60**	**1.56**
Were you ever expelled? (No)	1.20	1.10	**2.34**	1.01	**1.44**	**1.99**	**2.54**
Level of stress/strain	**1.28**	**1.19**	**1.24**	1.10	**1.10**	**1.06**	1.04
EOTB Relationships with peers	**0.84**	**0.84**	**0.84**	**0.82**	**0.92**	**0.93**	1.04
EOTA Work I enjoy most is available	**0.60**	**0.67**	**0.61**	**0.71**	**0.84**	**0.92**	1.05
EOTA Your personal and family life	**0.61**	**0.68**	0.86	1.05	**0.82**	**0.93**	0.93
APFT1 Push-ups	0.82	**0.67**	1.23	0.62	0.93	1.00	**0.63**
Average grades in high school	0.95	0.92	0.94	0.94	0.99	**0.88**	**0.89**
EOTA Medical advice against exercise (Yes)	1.63	**0.27**	**0.27**	0.80	**0.45**	**0.71**	0.60
EOTB Advise male about joining Army (Not Army)	**0.38**	**0.63**	0.72	0.70	**0.66**	**0.80**	0.77
EOTA Reluctant to leave for bit more	**0.66**	**0.62**	0.82	**0.72**	**0.89**	**0.91**	**0.88**
EOTA Health now compared to at entry	**0.62**	**0.65**	**0.80**	**0.74**	**0.85**	**0.93**	1.05
EOTA Relationships with peers	**0.65**	**0.69**	0.92	0.87	**0.90**	**0.90**	**0.84**
EOTA Advise male about joining Army (Not Army)	**0.34**	**0.32**	**0.60**	**0.59**	**0.69**	**0.76**	0.82
Average fitness level before Army	**0.80**	**0.74**	**0.74**	**0.69**	**0.90**	**0.92**	**0.85**
Never sent to principal's office (Sent)	**0.75**	0.83	0.96	1.08	**0.82**	**0.68**	**0.67**
EOTB Important to complete enlistment	**0.63**	**0.77**	**0.77**	**0.77**	**0.80**	**0.92**	0.93
APFT1 Run	0.70	0.87	0.68	**0.24**	0.80	0.91	0.90
EOTA Important to complete enlistment	**0.46**	**0.52**	**0.61**	**0.58**	**0.75**	**0.84**	0.97
APFT2 Run	0.72	**0.49**	0.67	**0.32**	**0.75**	0.89	0.76
Never thought about quitting HS (Yes)	**0.57**	**0.56**	**0.57**	0.88	**0.59**	**0.54**	**0.72**
Fixed							
EOTB Get into serious trouble?	**1.10**						
Wife/Husband/Girlfriend/Boyfriend (No)	**1.30**						
EOTA Have you been sexually harassed?	**1.09**						
EOTA Army people help when needed	**0.91**						
EOTA Barracks living	**0.92**						
EOTA Discrimination? (Yes)	**0.76**						
EOTB Being away from family and friends	**0.90**						
EOTA Amount of personal freedom	**0.88**						
EOTA Combat flow of illegal drugs	**0.88**						
APFT2 Sit-ups	**0.84**						
APFT1 Sit-ups	**0.83**						
How long in DEP?	**0.84**						

Table 7.12. (Continued)

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Months 5-11	*OR* Months 12-33	*OR* Months 34-42
Survey Composites							
Time Varying							
SRS Trouble in School	**1.16**	**1.19**	**1.21**	1.05	**1.17**	**1.28**	**1.23**
EOTA Reasons for Leaving - Problems Adjusting	**1.79**	**1.74**	**1.34**	**1.47**	**1.27**	**1.19**	1.12
EOTA Reasons for Leaving - All Reasons	**1.55**	**1.59**	**1.36**	**1.39**	**1.30**	**1.17**	**1.14**
EOTB Reasons for Leaving - Problems Adjusting	**1.37**	**1.24**	**1.26**	**1.22**	**1.19**	**1.11**	1.09
EOTB Reasons for Leaving - All Reasons	**1.32**	**1.21**	**1.25**	1.14	**1.17**	**1.09**	1.04
SRS Military vs. Civilian Life - Pay	1.01	**1.18**	0.95	1.10	**1.08**	**1.14**	**1.11**
EOTA Reasons for Leaving - Medical Issues	**1.61**	**1.46**	1.15	1.09	**1.22**	**1.05**	1.08
EOTB Reasons for Leaving - Medical Issues	**1.20**	**1.24**	**1.23**	1.12	**1.14**	**1.05**	1.05
SRS Attrition Cognitions	**1.25**	**1.30**	**1.28**	**1.22**	**1.12**	**1.05**	1.00
EOTB Military vs. Civilian Life - Pay	**0.80**	0.95	1.07	1.03	1.07	**1.09**	**1.17**
SRS Reasons for Leaving Army - All Reasons	**1.11**	**1.16**	**1.25**	**1.15**	**1.11**	**1.03**	1.08
EOTA Satisfaction with Supervision - Leader Self-Promotion	**1.36**	1.20	0.92	1.11	**1.09**	**1.08**	**0.88**
EOTB Continuance Intentions	**0.80**	0.93	0.94	0.93	1.00	**1.05**	1.04
EOTB Military vs. Civilian Life - Time for Personal Life	**0.76**	0.91	0.90	0.97	1.02	1.04	1.08
EOTB Military vs. Civilian Life - Benefits	**0.82**	0.93	1.12	1.12	0.99	1.03	1.03
EOTA Continuance Intentions	**0.38**	**0.57**	**0.78**	**0.64**	**0.91**	1.00	1.10
EOTB Military vs. Civilian Life - Job Characteristics	**0.73**	**0.84**	0.99	0.89	0.97	1.02	0.98
SRS Reasons for Joining Army - Training and Experience	**0.89**	**0.85**	**0.84**	0.97	0.99	1.01	0.98
EOTB Satisfaction with Work-Family Balance	**0.73**	0.96	0.97	0.89	0.98	1.00	1.03
EOTB Satisfaction with Officers	**0.79**	0.96	1.09	0.97	1.00	0.97	0.92
AIM: Social Desirability	0.98	**0.85**	0.99	**1.24**	1.06	**0.94**	0.95
EOTB Satisfaction with Training	**0.74**	**0.82**	0.90	0.87	**0.92**	0.98	1.02
EOTA Military vs. Civilian Life - Time for Personal Life	0.74	**0.72**	0.78	0.89	**0.90**	0.98	0.98
EOTA Satisfaction with Work-Family Balance	**0.58**	**0.72**	0.87	**0.72**	**0.91**	**0.94**	1.02
EOTA Military vs. Civilian Life - Overall	**0.64**	**0.65**	**0.79**	**0.73**	**0.90**	**0.94**	1.03
SRS Generalized Self Efficacy	**0.83**	**0.74**	**0.76**	**0.78**	**0.91**	**0.97**	0.94
EOTA Military vs. Civilian Life - Job Characteristics	**0.60**	**0.62**	0.84	**0.68**	**0.88**	**0.92**	1.02
EOTB Core Army Values - Loyalty, Selfless Service	**0.77**	0.89	0.89	0.89	**0.85**	**0.93**	0.94
EOTB Satisfaction with Army Life	**0.61**	**0.82**	0.92	**0.81**	**0.88**	**0.92**	0.99
EOTA Satisfaction with Training	**0.47**	**0.56**	**0.78**	**0.77**	**0.86**	**0.92**	0.99
EOTA Satisfaction with Officers	**0.68**	**0.69**	**0.80**	0.81	0.93	**0.90**	0.94
EOTB Affective Commitment	**0.67**	**0.86**	**0.81**	**0.84**	**0.88**	**0.92**	0.91
EOTB Perceived Fit with Army	**0.70**	**0.81**	**0.84**	**0.76**	**0.82**	**0.91**	**0.88**
EOTA Core Army Values - Duty, Integrity, Courage	**0.65**	**0.62**	0.87	**0.76**	**0.84**	**0.89**	0.89
EOTB Efficacy for Performance	**0.66**	**0.70**	**0.77**	**0.74**	**0.82**	**0.91**	0.94
EOTB Job Performance (self-rated)	**0.77**	**0.82**	**0.80**	**0.79**	**0.82**	**0.87**	0.99
EOTA Satisfaction with Army Life	**0.46**	**0.58**	**0.58**	**0.63**	**0.82**	**0.87**	0.94
EOTA Core Army Values - Loyalty, Selfless Service	**0.59**	**0.57**	**0.79**	**0.66**	**0.81**	**0.87**	0.93
EOTA Physical Fitness	**0.49**	**0.46**	**0.49**	**0.55**	**0.80**	**0.90**	0.95
EOTA Affective Commitment	**0.46**	**0.49**	**0.68**	**0.65**	**0.82**	**0.84**	0.96
APFT1 Total (push-ups+sit-ups+run)	**0.65**	0.71	0.93	**0.36**	**0.76**	0.93	**0.66**
EOTB Physical Fitness	**0.70**	**0.62**	**0.69**	**0.67**	**0.79**	**0.88**	0.93
APFT2 Total (push-ups+sit-ups+run)	0.77	**0.56**	0.72	**0.45**	**0.72**	0.93	**0.70**

Table 7.12. (Continued)

Predictor	*OR* Month 1[a]	*OR* Month 2	*OR* Month 3	*OR* Month 4	*OR* Months 5-11	*OR* Months 12-33	*OR* Months 34-42
EOTA Efficacy for Performance	**0.39**	**0.44**	**0.55**	**0.57**	**0.78**	**0.85**	0.92
EOTA Job Performance (self-rated)	**0.56**	**0.52**	**0.69**	**0.67**	**0.78**	**0.82**	0.90
EOTA Perceived Fit with Army	**0.49**	**0.53**	**0.65**	**0.62**	**0.82**	**0.82**	**0.84**
Fixed							
SRS Thoughts of Quitting High School	**1.23**						
SRS Reasons for Quitting Previous Jobs	**1.15**						
SRS Reasons for Joining Army - Escape Problems	**1.10**						
EOTA Incidents of Discrimination	**1.09**						
SRS Continuance Intentions	**1.07**						
SRS Reasons for Leaving Army - Problems Adjusting	**1.07**						
Fitness Score (APFT2 - APFT1)	0.98						
EOTA Military vs. Civilian Life - Benefits	**0.95**						
EOTB Satisfaction with Supervision - Leader Support	**0.94**						
EOTB Core Army Values - Duty, Integrity, Courage	**0.93**						
BCT Ratings of Motivation and Discipline	0.92						
BCT Ratings of Army Values, Motivation, and Discipline	0.92						
EOTA Satisfaction with Supervision - Leader Support	**0.89**						
AIM: Adjustment	**0.89**						
AIM: Work Orientation	**0.88**						
AIM: Agreeableness	**0.87**						
AIM: Physical Condition	**0.85**						
AIM: Dependability	**0.80**						

Note. We report unstandardized odds ratios for categorical variables (reference groups are noted in parentheses). For continuous variables, standardized odds ratios are reported. [a] If no odds ratios are listed beyond the 1st month for a given predictor, the odds ratio listed under the first month, indicates that the effect of the predictor did not vary significantly across time and that the OR presented reflects the main effect for that predictor across all months in unit.
Within each grouping, predictors are sorted in descending order of their point-biserial correlation with overall unit attrition. Odds ratios that are statistically significant ($p < .05$) appear in boldface.

Results

The results of the multivariate regression analyses reside in three large tables. Tables 7.14 and 7.15 present odds ratios and changes (indicated by the Greek letter Δ) in the –2 Log Likelihood statistics for each variable constituting the "maximum prediction" and "operational prediction" models (i.e., models "A" and "B," respectively) for Overall attrition. The latter statistic indicates the change in the –2 Log Likelihood statistic that would result should we remove the predictor from the model. Larger values indicate variables with stronger associations with the attrition criterion (conditional on the other predictors in the model).

The third table, Table 7.16, presents the results of the multivariate regression modeling analysis. We evaluated eight types of multivariate regression models for each of the six attrition criteria: the maximum prediction model (designated "A"), the operational prediction model (designated "B"), and three reference models for each prediction model A and B. The reference models selected for analysis comprise the following predictor sets: (a) all administrative

Table 7.13. Mapping of Predictor Variables into Multivariate Predictor Models (by Criterion)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
SRS Model						
Administrative						
Gender	A	A	A	A	A	
AFQT	A, B	A				
BMI Category	A		A, B	A, B		B
CMF Category	A	A	A	A		
# Dependents at Entry	A					
Education Tier	A, B	A, B			A, B	
Enlistment Term	A, B	A, B		A, B	A, B	A, B
Marital Status at Entry					A	B
Medical Waiver A	A, B			A, B		A, B
Medical Waiver B	A, B	A, B				
MOS Cluster		A	A		A	
Entry Pay Grade	A, B	A, B	B	A, B		
Race/Ethnicity	A	A	A	A		A
Youth Program						A
High-Quality Recruit		B				
Single Items						
Army advertising	A, B	B				
Desire to serve my country	A, B	B				
Make Army a career	A, B				B	
Parent(s)/Guardian(s)	A	B				
Friend(s)		A				
Wife/Husband/Girlfriend/Boyfriend	B	A, B				A, B
Athletic Coach						
Teacher	A		A			
Recruiter	A, B	A, B				
Radio advertisement				A, B		
Television advertisement	A, B	A, B				
Printed advertisement						B

Table 7.13. (Continued)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
How long in DEP?	A, B	A, B	A, B	A	A, B	
Were you ever expelled?	A, B	A, B	A, B			
Were you ever suspended?	A, B	A, B				
Never thought about quitting HS	A, B	A, B	A			
Expelled or suspended			B			
Getting bad grades	B	B	A, B	A, B		
Didn't get along with students				B		
Wasn't going to graduate on time				B		
Wanted to work full time			B			
Other reasons (thought of quitting HS)						A
Participated in Athletic teams		B	A, B	A, B		
Participated in drama, music, art	B		B			
Average fitness level before Army	A, B		A, B	A, B		A, B
Medical advise against exercise		A, B				
Left job to join the military	B	A, B			B	
How often smoke before DEP?	A, B	A, B	A, B	A, B	A, B	
Work I enjoy most is available in Army		B				
Difficult to find good civilian job						B
Advise male about joining Army			B			A
Don't have any uncertainty				B		
Fail physical requirements	B		A, B	A, B		
Family problems at home		A				
Poor academic performance	B				A, B	
Not getting desired military job	B		B			B
Level of strain, conflict or stress (R)				A, B		
Current level of morale	B	A, B				
Composites						
SRS Reasons for Leaving Army - Problems Adjusting		A			B	
SRS Attrition Cognitions	A, B		A, B		A,B	A, B
SRS Continuance Intentions			A, B			
SRS Reasons for Leaving Army - Deviance	A, B	A, B				

Table 7.13. (Continued)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
SRS Reasons for Joining Army - Escape Problems	A, B	A, B			A	
SRS Reasons for Joining Army - Personal Growth				A, B		A, B
SRS Participation in High School Activities	A, B	A		A, B	A, B	
SRS Reasons for Leaving Army - All Reasons		A, B				
SRS Importance of Core Army Values - Loyalty and Selfless Service		A				
SRS Military vs. Civilian Life - Overall	A		A, B	A, B		
SRS Military vs. Civilian Life - Pay	A, B	A, B				
SRS Reasons for Leaving Army - Discrimination	A					
SRS Military vs. Civilian Life - Time for Personal Life				A, B		A, B
SRS Military vs. Civilian Life - Quality of Work Life	A		A, B	A, B	A	
SRS Thoughts of Quitting High School	B		B	A	A	
SRS Reasons for Quitting Previous Jobs	A, B	B		A, B	B	A, B
SRS Reasons for Joining Army - Opportunity to Travel	A			A, B	A	
SRS Trouble in School	A, B	A, B	A, B			
SRS Unsure about Army Career	A, B	A, B				
SRS Reasons for Joining Army - Training and Experience		B	B			
EOTB Model						
Administrative						
Education Tier	A, B	A, B	A, B		A, B	
Gender	A	A	A		A	
	A, B	A, B				A
Enlistment Term	A, B	A, B				A, B
Race/Ethnicity	A	A	A	A		A
Medical Waiver B	A, B	A, B				
High-Quality Recruit	A	B				A
Medical Waiver A	A					
MOS Cluster	A	A		A		
BMI Category		A		A, B		B
CMF Category		A	A			A

Table 7.13. (Continued)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
Medical Waiver C			A, B			
# Dependents at Entry		B				
Single Items						
Health now compared to at entry		A		B		
Medical problems during training	A, B	A, B	A, B	A, B	A	A, B
Rewarding career compensates				A, B		A
Get into serious trouble?	A, B	A, B			B	
Have you been sexually harassed?	A, B	A			A	
Discrimination? No	A, B	A				
All are treated the same			B			
Most severe to Men			B			
Most severe to Blacks			A, B			B
Relationships with peers					A	
Army's gender mix				A		A
Discipline	A	A	A, B			
Barracks living					B	
Being away from family and friends	A	A				
Combat flow of illegal drugs	A, B	A, B				
Train public employees						A, B
Fail physical requirements				A	A	
Poor academic performance						A
Not getting desired military job						A
Level of strain, conflict or stress	A, B	A, B	B	A, B	A, B	
Difficult to find good civilian job	A, B	A, B		A		A
Family situation makes leaving difficult	A	A, B				
Advise male about joining Army	A	B				
Girlfriend/boyfriend in your life?	A, B	B			A	A, B
Going to college?	A	A, B	A, B	B		
Important to complete enlistment	A, B		A, B	A, B	A	
None of the above (Why unsure of Army career?)		A, B		A, B		

Table 7.13. (Continued)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
Composites						
EOTB Possible Reasons for Leaving the Army - Problems Adjusting	A, B	A				
EOTB Military vs. Civilian Life - Benefits						A
EOTB Continuance Intentions	A		A, B			
EOTB Possible Reasons for Leaving the Army - Discrimination			B			A
EOTB Perceived Fit with Army		A				A
EOTB Incidents of Discrimination			A, B	A		
EOTB Possible Reasons for Leaving Army - All Reasons						A
EOTB Importance of Core Army Values - Loyalty and Selfless Service		A, B			B	
EOTB Military vs. Civilian Life - Overall	A, B	A, B		B		
EOTB Military vs. Civilian Life - Pay	B			A		
EOTB Job Performance (self-rated)		A, B				
EOTB Physical Fitness	A, B	A, B	A, B	A, B		
EOTB Satisfaction with Supervision - Leader Self-Promotion		A, B				
EOTB Unsure about Army Career	A, B		A, B		B	
EOTB Importance of Core Army Values - Duty, Integrity, and Personal Courage					B	
EOTB Possible Reasons for Leaving the Army - Medical Issues					B	
EOTB Military vs. Civilian Life - Time for Personal Life					B	
EOTB Satisfaction with Work-Family Balance				B		
EOTA Model						
Administrative						
Gender	A	A		A	A	
AFQT Category	A, B	A, B				
BMI Category	A, B			A, B		B
Enlistment Bonus Option	A	B				
CMF Category	A	A	A			A
Education Tier	A, B	A, B			A	
Enlistment Term	A, B	A, B			A, B	A, B

Table 7.13. (Continued)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
Married at Entry	A, B	A, B				
Medical Waiver A	A, B			A, B		
Medical Waiver B	A, B	A, B				
Medical Waiver E	A, B	A, B				
Pay Grade at Entry		B				
MOS Cluster					A	
Race/Ethnicity	A	A		A		A
Moral Character Enlistment Waiver		B				
Youth Program	A, B					
Single Items						
Health now compared to at entry	A, B			A, B		
Medical problems during training	A, B	A, B	A	A, B	A, B	A, B
Medical advice against exercise (R)		A		A		
Reluctant to leave for bit more						A
Difficult to have family life (R)	B					
Lack of good alternatives to Army	A, B	A, B				
Get into serious trouble?	A, B	A, B	A, B			
Have you been sexually harassed?	B					
All are treated the same				A, B		
Most severe to Hispanics						A
Most severe to others			A	A		
Discipline		A				
Physical fitness training		B				
Being away from family and friends	A		A			
Your personal and family life	A					
Combat flow of illegal drugs	A, B	A, B				
UN peacekeeping	B		B			
Train public employees	A, B			A, B	A	
Fail physical requirements			A	A		
Better job outside the Army		A				

Table 7.13. (Continued)

Predictor	Type of Attrition					
	Overall	Moral Character	Performance	Medical/ Physical	Other	Pregnancy/ Parenthood
Injuries during training		A				
Not getting desired military job				A		
Level of strain, conflict or stress	A, B	A, B	A, B	A	B	
Difficult to find good civilian job	A, B	A, B				
Advise male about joining Army		A				
Advise female about joining Army			B			
Girlfriend/boyfriend in your life?						B
Significant other supportive Army career?	A, B				B	
Going to college?			A, B			
Important to complete enlistment	A, B		A, B	A	A	
None of the above (Why unsure of Army career?)	A					
Composites						
EOTA Reasons for Leaving the Army - Problems Adjusting					A	
EOTA Affective Commitment					B	
EOTA Continuance Intentions	A, B	A, B				
EOTA Reasons for Leaving the Army - Discrimination	A, B	A, B				
EOTA Efficacy for Performance				A, B		
EOTA Perceived Fit with Army	A, B	A, B			A, B	
EOTA Reasons for Leaving Army - All Reasons	A, B	A, B				
EOTA Reasons for Leaving the Army - Medical Issues				A, B		
EOTA Military vs. Civilian Life - Pay	B	A, B				
EOTA Job Performance (self-rated)	A, B	A, B	A, B			
EOTA Physical Fitness		A	A, B			
EOTA Satisfaction with Supervision - Leader Self-Promotion			A			
EOTA Satisfaction with Training	A					
EOTA Incidents of Discrimination				B		

Note. A = Variable was in maximum prediction model. B = Variable was in operational prediction model. (R) = Reverse coding.

Table 7.14. Standardized Odds Ratios and Δ –2 Log Likelihood Statistics for Predictors in the Three Maximum Prediction ("A") Multivariate Models for Overall Unit Attrition

	Overall	
	Std. *OR*	Δ -2LL
SRS Model		
Gender (Female)	2.59	273.4
AFQT Category (Cat II)	1.32	13.1
(Cat IIIA)	1.45	
(Cat IIIB)	1.48	
(Cat IV)	1.21	
BMI Category (Underweight)	1.03	27.2
(Overweight)	1.02	
(Obese)	1.47	
CMF Category (Intelligence)	1.32	110.2
(Combat Operations)	1.67	
(Logistics)	1.12	
(Civil & Public Affairs)	1.45	
(Communications)	0.97	
# of Dependents at Entry (1)	1.28	110.2
(2)	1.23	
(3)	0.85	
(4)	1.61	
(5+)	2.33	
Education Tier (Tier 2)	1.37	19.1
(Tier 3)	0.93	
Enlistment Term (2 Years)	0.30	121.5
(3 Years)	0.70	
(5 Years)	1.12	
(6 Years)	1.07	
Medical Waiver A (Yes)	1.23	5.3
Medical Waiver B (Yes)	1.55	6.1
Entry Pay Grade (E2)	0.82	33.7
(E3)	0.76	
(E4 or above)	0.57	
Race/Ethnicity (Black)	1.05	19.2
(Hispanic)	0.83	
(Other)	0.78	
Army advertising	0.96	4.6
Desire to serve my country	0.95	5.0
Make Army a career	1.08	12.0
Parent(s)/Guardian(s)	1.10	6.5
Teacher	1.13	3.8
Recruiter	1.12	7.4
Television advertisement	0.88	5.9
How long in DEP?	0.89	30.7
Were you ever expelled?	1.29	10.8
Were you ever suspended?	1.20	18.2

Table 7.14. (Continued)

	Overall	
	Std. *OR*	Δ -2LL
Never thought about quitting HS	0.73	43.6
Average fitness level before Army	0.96	4.9
How often smoke before DEP?	1.54	111.1
SRS Attrition Cognitions	0.90	22.4
SRS Reasons for Leaving Army - Deviance	1.13	10.9
SRS Reasons for Joining Army - Escape Problems	1.07	13.1
SRS Participation in High School Activities	0.92	13.3
SRS Military vs. Civilian Life - Overall	1.07	6.4
SRS Military vs. Civilian Life - Pay	1.07	5.7
SRS Reasons for Leaving Army - Discrimination	0.95	4.3
SRS Military vs. Civilian Life - Quality of Work Life	1.07	4.5
SRS Reasons for Quitting Previous Jobs	0.96	4.1
SRS Reasons for Joining Army - Opportunity to Travel	1.04	6.3
SRS Trouble in School	1.11	20.9
SRS Unsure about Army Career	0.94	11.5
EOTB Model		
Education Tier (Tier 2)	2.09	150.4
(Tier 3)	0.90	
Gender (Female)	1.82	169.8
Entry Pay Grade (E2)	0.86	53.6
(E3)	0.71	
(E4 or above)	0.51	
Enlistment Term (2 Years)	0.28	120.2
(3 Years)	0.70	
(5 Years)	1.11	
(6 Years)	0.97	
Race/Ethnicity (Black)	0.98	95.7
(Hispanic)	0.60	
(Other)	0.59	
Medical Waiver B (Yes)	1.98	19.3
High Quality Recruit	0.85	13.6
Medical Waiver A (Yes)	1.19	4.4
MOS Cluster (Combat Support)	0.66	48.5
(Combat Service Support)	0.68	
(Unknown)	0.46	
Medical problems during training	1.39	76.9
Get into serious trouble?	1.09	27.8
Have you been sexually harassed?	1.05	7.1
Discrimination? No	0.86	6.2
Discipline	1.05	5.9
Being away from family and friends	0.94	10.1
Combat flow of illegal drugs	0.93	17.1
Level of strain, conflict or stress	0.89	36.2

Table 7.14. (Continued)

	Overall	
	Std. *OR*	Δ -2LL
Difficult to find good civilian job	0.91	26.1
Family situation makes leaving difficult	1.04	4.1
Advise male about joining Army	0.86	6.5
Girlfriend/boyfriend in your life?	1.13	10.7
Going to college?	0.95	9.2
Important to complete enlistment	0.89	28.4
None of the above (Why unsure of Army career?)		
EOTB Possible Reasons for Leaving the Army - Problems Adjusting	1.56	21.6
EOTB Continuance Intentions	1.05	5.0
EOTB Military vs. Civilian Life - Overall	1.13	31.4
EOTB Physical Fitness	0.90	31.5
EOTB Unsure about Army Career	0.90	26.9
EOTA Model		
Gender	2.34	95.8
AFQT Category (Cat II)	1.60	16.0
(Cat IIIA)	1.76	
(Cat IIIB)	1.99	
(Cat IV)	1.67	
BMI Category (Underweight)	1.25	19.8
(Overweight)	0.92	
(Obese)	1.45	
Enlistment Bonus (< $1,500)	1.01	7.5
($1,500 - $3,000)	0.85	
(> $3,000)	2.15	
CMF Category (Intelligence)	0.30	61.8
(Combat Operations)	1.66	
(Logistics)	1.04	
(Civil & Public Affairs)	1.79	
(Communications)	1.00	
Education Tier (Tier 2)	2.02	81.1
(Tier 3)	1.78	
Enlistment Term (2 Years)	0.23	69.2
(3 Years)	0.70	
(5 Years)	1.00	
(6 Years)	1.19	
Marital Status at Entry (Married)	0.83	6.7
Medical Waiver A (Yes)	1.34	5.3
Medical Waiver B (Yes)	2.18	13.7
Medical Waiver E (Yes)	0.75	5.4
Race/Ethnicity (Black)	1.02	18.5
(Hispanic)	0.73	
(Other)	0.73	
Youth Program (JROTC/ROTC – Army)	0.72	8.3

Table 7.14. (Continued)

	Overall	
	Std. *OR*	Δ -2LL
(JROTC/ROTC – Other Service)	0.74	
(Other Program)	0.61	
Health now compared to at entry	0.95	3.9
Medical problems during training	1.38	33.3
Lack of good alternatives to Army	1.13	17.5
Get into serious trouble?	1.17	43.4
Being away from family and friends	1.07	5.0
Your personal and family life	0.93	5.4
Combat flow of illegal drugs	0.92	10.0
Train public employees	1.11	12.6
Level of strain, conflict or stress	0.85	30.3
Difficult to find good civilian job	0.94	4.2
Significant other supportive Army career?	1.07	6.5
Important to complete enlistment	0.86	23.0
None of the above (Why unsure of Army career?)	1.12	4.2
EOTA Continuance Intentions	1.07	4.5
EOTA Reasons for Leaving the Army - Discrimination	0.67	6.0
EOTA Perceived Fit with Army	0.90	9.7
EOTA Reasons for Leaving Army - All Reasons	1.20	26.3
EOTA Job Performance (self-rated)	0.92	6.7
EOTA Satisfaction with Training	1.07	4.1

For administrative variables and dichotomous survey variables, unstandardized odds ratios are reported.

Δ - 2LL indicates the change in -2LL when the given predictor is removed from the model.

variables (see Table 7.17), (b) the best single predictor variable from the survey data (see Table 7.18), and (c) the best single predictor along with the total set of administrative variables (i.e., the combination of the first two reference models). These models were estimated using each of the three sets of survey data. Hence, the tables contain results for 8x6x3 = 144 regression models.

Table 7.16 presents the following statistics for each of the eight models: (a) *df*—model degrees of freedom, (b) *k*—number of predictors, (c) *c*—the *c*-statistic for the model, (d) lower and upper bound values of *c* given a 95% confidence interval, (e) the raw point-biserial correlation between the predicted values from the model and the criterion, (f) the adjusted value of the raw point-biserial (again using the adjustment to a basis of .50 described by Kemery et al., 1988), and (g) model utility information, which presents the attrition rate observed among those Soldiers who score in the bottom 5%, 10%, and 15% of the score distribution on the predictor composite, as well as the baseline attrition rate for the analysis sample.

Table 7.15. Standardized Odds Ratios and Δ –2 Log Likelihood Statistics for Predictors in the Three Operational Prediction ("B") Multivariate Models for Overall Unit Attrition

	Predictor	Overall Attrition Std. *OR*	Overall Attrition Δ -2LL
Administrative Variables	Education Tier (Tier 2)	1.23	8.2
	(Tier 3)	0.81	
	Entry Pay Grade (E2)	0.85	
	(E3)	0.78	27.0
	(E4 or above)	0.56	
	Enlistment Term (2 Years)	0.32	
	(3 Years)	0.76	103.9
	(5 Years)	1.27	
	(6 Years)	0.95	
	AFQT Category (Cat II)	1.33	
	(Cat IIIA)	1.52	17.6
	(Cat IIIB)	1.48	
	(Cat IV)	1.12	
	Medical Waiver A (Yes)	1.43	15.9
	Medical Waiver B (Yes)	1.52	5.1
SRS single item predictors (not appearing in Composites)	Army advertising	0.95	6.6
	Desire to serve my country	0.95	9.2
	Make Army a career	1.10	33.6
	Wife/Husband/Girlfriend/Boyfriend	1.17	10.2
	Recruiter	1.14	9.4
	Television advertisement	0.88	5.8
	How long in DEP?	0.94	22.1
	Were you ever expelled?	1.26	8.4
	Were you ever suspended?	1.17	12.1
	Never thought about quitting HS	0.81	9.7
	Average fitness level before Army	0.91	18.0
	How often smoke before DEP?	1.49	93.9
	Current level of morale	1.06	5.7
	Getting bad grades	0.73	10.2
	Participated in drama, music, art	1.11	9.2
	Left job to join the military	0.78	38.8
	Poor academic performance	0.85	4.8
SRS Composites	SRS Attrition Cognitions	1.14	33.4
	SRS Reasons for Leaving Army - Deviance	1.05	4.4
	SRS Reasons for Joining Army - Escape Problems	1.05	6.0
	SRS Participation in High School Activities	1.07	7.5
	SRS Military vs. Civilian Life - Pay	1.12	27.3
	SRS Thoughts of Quitting High School	1.08	4.8
	SRS Reasons for Quitting Previous Jobs	1.10	19.7
	SRS Trouble in School	1.09	12.4
	SRS Unsure about Army Career	0.93	12.2

Table 7.15. (Continued)

Predictor			Overall Attrition Std. *OR*	Δ -2LL
Administrative Variables		Education Tier (Tier 2)	2.273	232.63
		(Tier 3)	0.854	
		Entry Pay Grade (E2)	0.872	
		(E3)	0.725	54.589
		(E4 or above)	0.512	
		Enlistment Term (2 Years)	0.257	
		(3 Years)	0.716	134.08
		(5 Years)	1.010	5
		(6 Years)	0.883	
		Medical Waiver B (Yes)	1.856	16.307
EOTB single item predictors (not appearing in Composites)				138.52
		Medical problems during training	1.528	5
		Get into serious trouble?	1.465	29.242
		Have you been sexually harassed?	1.172	12.931
		Discrimination? No	0.859	6.577
		Combat flow of illegal drugs	0.925	28.742
		Level of strain, conflict or stress	0.895	68.659
		Difficult to find good civilian job	0.925	29.76
		Girlfriend/boyfriend in your life?	1.159	16.676
		Important to complete enlistment	0.875	29.018
EOTB Composites		EOTB Military vs. Civilian Life - Overall	1.090	11.386
		EOTB Military vs. Civilian Life - Pay	1.097	15.753
		EOTB Physical Fitness	0.865	62.494
		EOTB Possible Reasons for Leaving the Army - Problems Adjusting	1.083	16.7
		EOTB Unsure about Army Career	0.891	37.322
Administrative Variables		Education Tier (Tier 2)	1.845	66.877
		(Tier 3)	2.177	
		Enlistment Term (2 Years)	0.202	
		(3 Years)	0.713	81.732
		(5 Years)	1.385	
		(6 Years)	1.009	
		AFQT Category (Cat II)	1.668	
		(Cat IIIA)	1.883	15.323
		(Cat IIIB)	1.94	
		(Cat IV)	1.519	
		Medical Waiver A (Yes)	1.521	11.405
		Medical Waiver B (Yes)	1.89	9.012
		BMI Category (Underweight)	1.341	
		(Overweight)	0.883	19.997
		(Obese)	1.336	
		Married at Entry (Yes)	0.821	7.857
		Youth Program (Yes)	0.806	6.95
		Medical Waiver E	0.771	4.413

Table 7.15. (Continued)

Predictor		Overall Attrition Std. *OR*	Δ -2LL
EOTA single item predictors (not appearing in Composites)	Health now compared to at entry	0.925	7.341
	Medical problems during training	1.474	50.824
	Difficult to have family life (R)	1.054	4.117
	Lack of good alternatives to Army	1.101	16.681
	Get into serious trouble?	1.553	32.058
	Have you been sexually harassed?	1.146	7.246
	Combat flow of illegal drugs	0.915	15.116
	UN peacekeeping	1.058	4.748
	Train public employees	1.09	8.78
	Level of strain, conflict or stress	0.877	41.223
	Difficult to find good civilian job	0.946	5.936
	Significant other supportive Army career?	1.06	6.007
	Important to complete enlistment	0.873	16.989
EOTA Composites	EOTA Affective Commitment		
	EOTA Continuance Intentions	1.090	7.994
	EOTA Job Performance (self-rated)	0.917	8.419
	EOTA Military vs. Civilian Life - Pay	1.067	4.995
	EOTA Perceived Fit with Army	0.920	6.505
	EOTA Reasons for Leaving Army - All Reasons	1.176	22.952
	EOTA Reasons for Leaving the Army - Discrimination	0.914	9.096

Note. For composite survey variables standardized odds ratios are reported.
Δ - 2LL indicates the change in -2LL when the given predictor is removed from the model. (R) = Reverse coding.

Overall Attrition

Table 7.14 shows gender to be the strongest predictor of Overall attrition in all three maximal prediction models, conditional on the other variables in those models, with females attriting at about 2.25 times the rate of males.[48] Other administrative variables having strong relations with Overall attrition in the multivariate prediction model vary by the model in question. For the SRS model, Career Management Field (CMF) category, number of dependents at entry, and enlistment term have strong effects. CMF category comprises six values: Administration, Intelligence, Combat Operations, Logistics, Civil & Public Affairs, and Communications. The odds ratios for this variable indicate that all CMF categories but Communications had higher attrition rates than Administration. As expected, relative to 4-year enlistees, those with shorter enlistment terms are more likely to complete their terms, and those with longer enlistment terms are less likely to complete theirs. Education Tier had a significant effect but one weaker than expected, as the odds of Tier 2 Soldiers attriting were just 1.37 times that of high school diploma graduates. The effect is much stronger in the EOT models, however, with the odds of attrition for Tier 2 Soldiers being nearly twice the odds of attrition for high school diploma graduates. The strongest effect for an SRS variable was item 42, "Smoking before DEP." The odds of attrition for Soldiers who smoked prior to DEP were 1.54 times those of non-smokers. (Note that this effect is stronger in this model than the effect of Education Tier in this model.)

[48] This is a simple mean of the odds ratios from the three models (SRS, EOTB, EOTA). The most potent odds ratio in the table belongs to the 2-year enlistment term variable (i.e., those with 2-year enlistments attrit at about 0.27 the rate of those with 4-year enlistments), but the overall effect of the Enlistment Term variable is not as large as the overall effect for Gender.

Table 7.16. Summary Statistics from Multivariate Prediction Models of Unit Attrition

	Model Fit and Validity							Model Utility			
				95% C.I. *c*				Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*				
Overall Attrition											
SRS A	57	36	.692	.683	.701	.301	.327	58.5%	52.4%	48.0%	25.3%
SRS B	43	34	.674	.664	.683	.274	.297	56.6%	50.3%	47.3%	25.4%
Reference Models(A)											
Admin Only	32	11	.644	.635	.654	.226	.245				
BestPred Only	1	1	.580	.570	.590	.144	.156				
BestPred + Admin Only	33	12	.664	.655	.674	.258	.280	51.8%	48.0%	45.4%	25.3%
Reference Models(B)											
Admin Only	35	12	.645	.635	.655	.225	.244				
BestPred Only	1	1	.579	.569	.589	.142	.154				
BestPred + Admin Only	36	1	.665	.655	.674	.256	.277	50.9%	47.2%	44.0%	25.4%
EOTB A	38	28	.684	.675	.693	.287	.313	55.0%	51.0%	47.1%	24.8%
EOTB B	24	18	.662	.653	.671	.255	.278	53.7%	49.1%	45.4%	24.8%
Reference Models(A)											
Admin Only	30	11	.651	.641	.660	.233	.254				
BestPred Only	1	1	.567	.558	.577	.116	.126				
BestPred + Admin Only	33	12	.662	.653	.671	.249	.271	48.2%	46.2%	44.6%	24.8%
Reference Models(B)											
Admin Only	33	12	.652	.643	.661	.234	.255				
BestPred Only	1	1	.567	.557	.577	.116	.126				
BestPred + Admin Only	34	13	.663	.654	.672	.250	.272	48.0%	45.4%	44.5%	24.8%
EOTA A	51	32	.704	.691	.716	.312	.346	56.2%	50.5%	46.5%	22.7%
EOTA B	37	28	.684	.671	.697	.283	.314	53.4%	46.9%	45.1%	22.6%

Table 7.16. (Continued)

Model	*df*	*k*	*c*	95% C.I. *c* Lower	Upper	r_{pb}	r_{pb}*	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
				Model Fit and Validity				Model Utility			
Reference Models(A)											
Admin Only	32	13	.652	.639	.665	.228	.253				
BestPred Only	1	1	.532	.517	.547	.112	.124				
BestPred + Admin Only	33	14	.662	.648	.675	.250	.277	50.2%	45.8%	41.9%	22.7%
Reference Models(B)											
Admin Only	32	13	.652	.638	.665	.227	.252				
BestPred Only	1	1	.530	.516	.545	.104	.115				
BestPred + Admin Only	33	14	.660	.646	.673	.246	.273	51.0%	45.1%	41.2%	22.6%
Moral Character Attrition											
SRS A	50	33	.740	.728	.751	.314	.394	42.8%	38.7%	34.9%	13.6%
SRS B	36	30	.729	.717	.741	.297	.372	42.3%	36.5%	33.0%	13.6%
Reference Models(A)											
Admin Only	31	21	.660	.648	.673	.208	.261				
BestPred Only	1	1	.636	.623	.649	.175	.219				
BestPred + Admin Only	31	22	.697	.685	.709	.248	.311	34.7%	32.4%	30.3%	13.6%
Reference Models(B)											
Admin Only	31	12	.660	.647	.673	.205	.257				
BestPred Only	1	1	.637	.624	.650	.177	.222				
BestPred + Admin Only	28	11	.697	.684	.709	.247	.309	35.0%	31.7%	30.1%	13.6%
EOTB A	45	29	.710	.698	.722	.267	.339	39.7%	33.2%	29.6%	12.9%
EOTB B	27	21	.683	.670	.695	.236	.299	35.9%	31.1%	28.7%	13.0%
Reference Models(A)											
Admin Only	34	13	.677	.665	.690	.221	.281				
BestPred Only	1	1	.525	.511	.539	.078	.010				
BestPred + Admin Only	34	13	.684	.672	.697	.231	.294	35.1%	30.9%	28.4%	12.9%

Table 7.16. (Continued)

Model	*df*	*k*	*c*	95% C.I. *c* Lower	Upper	r_{pb}	r_{pb}*	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
				Model Fit and Validity				Model Utility			
Reference Models(B)											
Admin Only	32	14	.677	.664	.689	.220	.279				
BestPred Only	1	1	.526	.512	.540	.081	.103				
BestPred + Admin Only	36	15	.685	.672	.697	.233	.296	34.2%	31.7%	28.7%	13.0%
EOTA A	40	27	.714	.702	.727	.278	.353	40.4%	34.6%	30.5%	12.9%
EOTA B	33	22	.692	.679	.705	.255	.324	38.6%	33.3%	29.2%	12.9%
Reference Models(A)											
Admin Only	30	13	.675	.661	.688	.216	.275				
BestPred Only	1	1	.543	.528	.559	.123	.156				
BestPred + Admin Only	30	13	.684	.671	.698	.241	.306	36.7%	31.4%	28.9%	12.9%
Reference Models(B)											
Admin Only	30	13	.674	.661	.687	.216	.275				
BestPred Only	1	1	.543	.528	.559	.124	.158				
BestPred + Admin Only	30	13	.684	.671	.697	.241	.306	35.7%	31.4%	28.8%	12.9%
Performance Attrition											
SRS A	29	19	.716	.696	.737	.194	.341	16.8%	13.6%	12.1%	4.4%
SRS B	25	21	.706	.685	.727	.174	.306	15.7%	12.3%	10.8%	4.4%
Reference Models(A)											
Admin Only	29	10	.665	.643	.686	.132	.232				
BestPred Only	1	1	.599	.576	.622	.084	.148				
BestPred + Admin Only	30	11	.687	.665	.708	.152	.267	15.5%	12.0%	10.6%	4.4%
Reference Models(B)											
Admin Only	29	10	.664	.642	.687	.133	.234				
BestPred Only	1	1	.605	.582	.628	.086	.151				
BestPred + Admin Only	27	10	.690	.668	.712	.151	.265	14.2%	12.0%	10.7%	4.4%

Table 7.16. (Continued)

			Model Fit and Validity					Model Utility			
				95% C.I. *c*							
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
EOTB A	23	16	.746	.723	.770	.224	.438	17.9%	13.2%	10.4%	3.2%
EOTB B	16	15	.718	.694	.743	.197	.381	14.4%	11.7%	9.4%	3.3%
Reference Models(A)											
Admin Only	23	10	.677	.652	.702	.133	.260				
BestPred Only	1	1	.605	.577	.634	.114	.223				
BestPred + Admin Only	24	10	.719	.694	.743	.173	.338	13.3%	10.7%	9.0%	3.2%
Reference Models(B)											
Admin Only	26	10	.684	.660	.708	.132	.255				
BestPred Only	1	1	.605	.577	.634	.115	.223				
BestPred + Admin Only	24	10	.721	.697	.745	.173	.335	13.4%	10.8%	9.1%	3.3%
EOTA A	16	12	.798	.795	.831	.272	.639	13.8%	10.0%	7.5%	1.9%
EOTA B	8	8	.768	.734	.802	.249	.585	13.1%	8.6%	6.9%	1.9%
Reference Models(A)											
Admin Only	20	6	.646	.610	.682	.081	.190				
BestPred Only	1	1	.658	.616	.699	.150	.353				
BestPred + Admin Only	17	6	.730	.694	.767	.181	.425	10.8%	7.8%	6.2%	1.9%
Reference Models(B)											
Admin Only	21	7	.648	.612	.684	.084	.197				
BestPred Only	1	1	.659	.618	.700	.150	.353				
BestPred + Admin Only	15	6	.721	.683	.759	.180	.423	11.1%	7.8%	6.3%	1.9%
Medical/Physical Attrition											
SRS A	36	23	.710	.693	.728	.201	.335	19.3%	16.2%	13.5%	5.2%
SRS B	28	21	.691	.672	.709	.185	.306	18.1%	14.9%	13.2%	5.3%

Table 7.16. (Continued)

			Model Fit and Validity					Model Utility			
				95% C.I. *c*				Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*				
Reference Models(A)											
Admin Only	20	7	.670	.651	.689	.158	.263				
BestPred Only	1	1	.579	.559	.598	.070	.117				
BestPred + Admin Only	21	8	.677	.658	.695	.169	.281	17.1%	14.5%	12.5%	5.2%
Reference Models(B)											
Admin Only	20	7	.670	.651	.688	.158	.261				
BestPred Only	1	1	.579	.559	.598	.070	.116				
BestPred + Admin Only	21	8	.677	.658	.695	.169	.280	17.4%	14.5%	12.4%	5.3%
EOTB A	20	14	.735	.715	.754	.223	.381	21.0%	16.4%	13.5%	4.8%
EOTB B	13	11	.716	.696	.736	.215	.367	20.2%	15.5%	13.6%	4.8%
Reference Models(A)											
Admin Only	21	8	.688	.668	.708	.159	.272				
BestPred Only	1	1	.640	.618	.662	.128	.219				
BestPred + Admin Only	26	10	.723	.703	.742	.201	.343	18.4%	14.6%	13.1%	4.8%
Reference Models(B)											
Admin Only	25	9	.691	.671	.710	.160	.273				
BestPred Only	1	1	.642	.621	.664	.130	.222				
BestPred + Admin Only	26	10	.724	.705	.744	.204	.349	18.2%	14.6%	13.3%	4.8%
EOTA A	20	16	.767	.744	.790	.255	.489	19.2%	13.4%	11.2%	3.4%
EOTA B	11	9	.736	.711	.762	.209	.400	16.4%	13.3%	10.5%	3.4%
Reference Models(A)											
Admin Only	12	5	.689	.663	.715	.158	.303				
BestPred Only	1	1	.578	.548	.608	.099	.190				
BestPred + Admin Only	13	6	.715	.689	.741	.188	.360	14.3%	11.4%	10.1%	3.4%

Table 7.16. (Continued)

			Model Fit and Validity					Model Utility			
				95% C.I. *c*							
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
Reference Models(B)											
Admin Only	12	5	.691	.665	.716	.157	.301				
BestPred Only	1	1	.579	.549	.609	.099	.189				
BestPred + Admin Only	13	6	.715	.689	.741	.188	.360	14.1%	11.4%	10.0%	3.4%
Other Attrition											
SRS A	21	15	.639	.592	.685	.122	.210	12.4%	10.4%	9.3%	4.7%
SRS B	15	11	.626	.607	.644	.102	.176	10.9%	8.8%	8.0%	4.7%
Reference Models(A)											
Admin Only	18	6	.618	.598	.637	.094	.162				
BestPred Only	1	1	.554	.533	.575	.054	.093				
BestPred + Admin Only	19	7	.626	.606	.646	.102	.176	11.3%	9.7%	9.1%	4.7%
Reference Models(B)											
Admin Only	18	6	.620	.601	.639	.095	.163				
BestPred Only	1	1	.553	.534	.575	.055	.095				
BestPred + Admin Only	19	7	.626	.606	.646	.102	.175	11.4%	9.8%	9.2%	4.7%
EOTB A	10	9	.618	.576	.660	.116	.200	13.4%	10.1%	9.5%	4.7%
EOTB B	10	9	.613	.591	.636	.101	.175	11.7%	10.0%	8.6%	4.6%
Reference Models(A)											
Admin Only	16	6	.625	.603	.647	.105	.181				
BestPred Only	1	1	.547	.526	.569	.040	.069				
BestPred + Admin Only	17	7	.628	.607	.650	.109	.187	11.2%	10.7%	9.0%	4.7%
Reference Models(B)											
Admin Only	16	6	.627	.605	.649	.108	.187				
BestPred Only	1	1	.545	.523	.567	.038	.066				
BestPred + Admin Only	17	7	.632	.610	.654	.112	.194	11.4%	10.7%	9.0%	4.6%
EOTA A	15	9	.662	.606	.718	.142	.248	13.5%	10.5%	9.1%	4.5%

Table 7.16. (Continued)

Model	*df*	*k*	*c*	95% C.I. *c* Lower	Upper	r_{pb}	r_{pb}*	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
				Model Fit and Validity				Model Utility			
EOTA B	9	6	.620	.590	.649	.108	.185	11.6%	9.8%	9.5%	4.8%
Reference Models(A)											
Admin Only	14	6	.636	.613	.658	.104	.181				
BestPred Only	1	1	.555	.529	.580	.065	.113				
BestPred + Admin Only	15	7	.655	.633	.678	.132	.230	12.9%	10.0%	9.1%	4.5%
Reference Models(B)											
Admin Only	15	6	.630	.601	.659	.105	.179				
BestPred Only	1	1	.550	.518	.581	.061	.104				
BestPred + Admin Only	16	7	.653	.625	.681	.126	.216	12.1%	10.4%	9.8%	4.8%
Pregnancy/Parenthood Attrition											
SRS A	20	13	.680	.655	.706	.273	.304	54.1%	46.1%	42.4%	22.1%
SRS B	20	13	.620	.588	.652	.207	.243	36.2%	33.9%	31.1%	17.6%
Reference Models(A)											
Admin Only	18	6	.649	.623	.675	.220	.246				22.0%
BestPred Only	1	1	.571	.543	.598	.106	.118				22.1%
BestPred + Admin Only	19	7	.655	.630	.681	.237	.265	46.4%	44.3%	40.4%	22.0%
Reference Models(B)											
Admin Only	12	5	.619	.593	.645	.165	.194				
BestPred Only	1	1	.561	.534	.587	.080	.094				
BestPred + Admin Only	13	6	.632	.606	.657	.181	.213	36.2%	32.1%	30.2%	17.6%
EOTB A	28	17	.667	.644	.690	.238	.274	42.7%	40.4%	36.4%	19.1%
EOTB B	11	6	.600	.577	.623	.128	.155	26.6%	26.2%	22.4%	15.7%
Reference Models(A)											
Admin Only	12	5	.621	.597	.645	.167	.192				19.2%
BestPred Only	1	1	.546	.521	.571	.073	.084				19.1%

Table 7.16. (Continued)

			Model Fit and Validity					Model Utility			
				95% C.I. *c*							
Model	*df*	*k*	*c*	Lower	Upper	r_{pb}	r_{pb}*	Attrition Rate Upper 5%	Attrition Rate Upper 10%	Attrition Rate Upper 15%	Base Rate in Model Sample
BestPred + Admin Only	17	6	.636	.613	.660	.187	.215	32.5%	34.0%	33.3%	19.2%
Reference Models(B)											
Admin Only	15	6	.612	.589	.635	.144	.174				
BestPred Only	1	1	.547	.524	.571	.069	.083				
BestPred + Admin Only	16	7	.622	.599	.645	.155	.187	23.9%	25.1%	26.0%	15.7%
EOTA A	15	6	.665	.634	.697	.254	.286	48.3%	45.8%	39.7%	21.1%
EOTA B	9	4	.620	.588	.652	.163	.191	35.8%	31.5%	30.2%	17.9%
Reference Models(A)											
Admin Only	13	4	.643	.611	.675	.215	.242				
BestPred Only	1	1	.568	.536	.601	.120	.135				
BestPred + Admin Only	13	4	.656	.624	.688	.239	.269	49.3%	40.8%	40.7%	21.1%
Reference Models(B)											
Admin Only	11	4	.619	.587	.650	.157	.184				
BestPred Only	1	1	.559	.527	.590	.098	.115				
BestPred + Admin Only	17	6	.643	.611	.674	.197	.230	35.1%	31.6%	29.6%	17.9%

Table 7.17. Administrative Variables Used in the Reference Model Analyses

AFQT Category
CDC BMI Category
CMF Category
Education Tier
Enlistment Bonus Option
Enlistment Term at Entry
Enlistment Waiver
High Quality Recruit (HSG + Cat I-IIIA)
Marital Status at Entry (S/M)
Medical Failure: Cardiovascular
Medical Failure: Drugs
Medical Failure: Other
Medical Failure: Physical Extremities
Medical Failure: Weight
Moral Character Enlistment Waiver
MOS Category (CA, CS, CSS)
Number of Dependents at Entry
Pay Grade at Entry
Physical Enlistment Waiver
Race/Ethnicity (W/B/H/O)
Gender
Youth Program Participation

Table 7.18. Best Survey Single Predictors for Reference Model Analysis

	Type of Attrition					
Survey	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
SRS	Smoked before DEP?	Trouble in School	Average fitness level before Army	Average fitness level before Army	Reasons for Quitting Previous Jobs	Never thought about quitting HS
EOTB	Medical problems during training	Get into serious trouble?	Physical Fitness	Physical Fitness	Girlfriend/boyfriend in your life?	Medical problems during training
EOTA	Get into serious trouble?	Get into serious trouble?	Physical Fitness	Physical Fitness	Important to complete enlistment	Important to complete enlistment

In the EOT models, items assessing medical problems during training, getting into serious trouble (i.e., UCMJ offenses), and strain/conflict/stress (items 13, 16, and 36, respectively) perform quite well.

Table 7.16 shows that for Overall attrition, the EOTA models perform best, although all three "A" models yield *c*-statistics around .70. Relative to the "A" models, the "B" models include fewer predictors. The average decrements in the *c*-statistic and point-biserial correlation for the "B" models are .02 and .03, respectively. In terms of utility for selection, the base rate for attrition is between 22.6% and 25.4%. Individuals in the bottom 10% of the predictor composite's score distribution, however, evidence an attrition rate twice as high as the base rate for the sample. This translates to just over half of this restricted sample attriting.

The reference models do not perform as well, with decrements of approximately .03 in the *c*-statistics and approximately .05 for the point-biserial correlations for the "A" models. For

the "B" models, however, the discrepancy is much less, with advantages of only .01 and .02 for the two statistics, respectively. The difference is least for the EOTB data and greatest for the EOTA data. Even so, the attrition rate in the low end of the "B" score distribution is a good bit higher than that in the lower portion of the reference models' distributions. For example, for the EOTB sample, although the *c*-statistics are the same for the reference and "B" models, the attrition rate in the lowest 10% is almost three percentage points higher for the "B" model. The reference models predict quite similarly across all three surveys, although the SRS sample lags a bit behind.

Moral Character Attrition

For Moral Character attrition, the most distal variables provide the best prediction: The SRS models win the day. The "A" model *c*-statistics all exceed .70 by a bit, whereas the "B" models hover around the .70 mark, with an average decrement of .02. The average discrepancy in point-biserial correlations is also .02. As for Overall attrition, the "B" models comprise fewer predictors. For utility statistics, the data demonstrate how well these prediction models identify those who attrit for moral character reasons. Specifically, whereas the base rate for this criterion is only about 13%, the base rate for those scoring in the lowest 10% of the predictor composite's score distribution is approximately 2.7 times that, with rates ranging from 33% to 39%. Those scoring in the lowest 5% of the distribution attrit at more than three times the base rate for the analysis sample. The decrement with the "B" models is slight, with the average base rate for those scoring in the lowest 10% being approximately 2.6 times that of the analysis sample.

As for the reference models, the EOTB and EOTA models perform nearly as well as the "B" models for these surveys, but the SRS "B" model predicts Moral Character attrition much better than its references (the *c*-statistic is .03 higher, and the point-biserial is .05 higher). Once again, however, there is an advantage in terms of identifying a higher attrition rate in the lowest 10% of the "B" model distribution as compared to the reference model distribution. (The advantage is slight however, averaging about one percentage point.) The "A" models all outpace the references. As with the survey data, the reference models predict best in the SRS sample.

Performance Attrition

For Performance attrition, we see the base rate for the event drop sharply, ranging from 4.4% for the SRS sample to just 1.9% for the EOTA sample. Perhaps not surprisingly, the models involving the most proximal variables (EOTA) do the best job of predicting Performance attrition, with *c*-statistics in the upper .70 range. As with the other criteria discussed thus far, the difference between the "A" and "B" models is about .02 for both the *c*-statistic and the point-biserial correlation. The "B" models comprise fewer predictors for the training survey models, but the SRS model actually contains two more predictors, although it still entails fewer degrees of freedom. Despite the single-digit base rates, we achieve reasonable predictive utility with both the "A" and "B" prediction models. Indeed, for the "A" models, the attrition rates for those scoring in the lowest 10% of the predictor composite's distribution are three, four, and five times that of the analysis sample, respectively.

As for the reference models, the "A" models continue to outperform the various reference models by a substantial margin. Here, however, the "B" models provide little improvement

except for the EOTA sample. As above, however, they do provide an improvement in terms of attrition rates in the lowest 10% of the composites' score distributions. Again, this advantage is approximately one percentage point—slight, but constant. The reference models perform best in the two IET survey samples, with a decrement in prediction for the SRS sample.

Medical/Physical Attrition

Medical/Physical attrition rates also lie in the single digits, ranging from 3.4% to 5.3%. For this criterion, however, we still obtain reasonable utility of prediction. The *c*-statistics range from the low to middle .70s, with "A" models outperforming "B" models. Again, the decrement in *c* and the point biserial is .02 when using the operational prediction equation instead of the maximal equation, and the "B" models comprise fewer predictors. In terms of prediction utility, the lowest 10% of the predictor composite's score distributions attrits at a rate that is three to four times that of the total analysis sample. Again, the EOTA model shows the strongest relation with the criterion.

The reference models show a similar pattern to that seen with the previous criteria: They perform quite similarly to (but a bit less well than) the "B" models for SRS and EOTA data, whereas the EOTB models are virtually identical in most ways except for the attrition rates in the lowest 10% of the score distributions, where the "B" models continue to hold an advantage of approximately one percentage point.

One additional note about the multivariate models for this criterion: The models include EOT survey item 35a. This item is endorsed by those who believe they might leave the Army in the next 6 months because of a failure to meet physical requirements. There is some potential for criterion contamination here—namely, that those who endorse this item already know that they have failed to meet the physical requirements and are simply biding their time before they must leave the Army. If this were true, then some of the predictive power of these models would be overstated.

Other Attrition

Several features of the modeling results for Other attrition deserve comment. First, the base rate is quite constant across the three analysis samples, "ranging" from 4.5% to 4.8%. Second, note that the *c*-statistics and point-biserial correlations are quite low. The relative inability to predict this category of attrition likely stems from its heterogeneity, so this is not necessarily a surprise. Third, although the attrition rates in the lowest 10% are approximately twice the base rates for the analysis samples, these models (both "A" and "B") provide the least predictive utility of any of the models discussed thus far. Fourth, note that except for EOTA, there is little difference between the "A" and "B" models. Finally, the "B" models comprise fewer predictors than the "A" models except for the EOTB sample, where the two models are the same size.

The reference models outperform the "B" models in all categories. The "A" models retain slight advantages, but they are of little consequence. By and large, the reference variables hold sway when predicting Other attrition.

Pregnancy/Parenthood Attrition

For this criterion, we consider females only. The base rate ranges from 17.6% to 22.1%. The measures of prediction strength (*c*-statistics and point-biserial correlations) are higher than for Other attrition, but they remain a bit lower than for the other criteria in the table. The SRS "A" and "B" models comprise the same number of predictors, but otherwise the "B" models are smaller. We do see a more noticeable difference in the "A" and "B" models in other important ways, however, with *c*-statistics and point-biserial correlations decreasing by approximately .05 and .09, respectively. Also, in terms of prediction utility, the attrition rate for the lowest 10% of the "A" model distributions exceeds the base rate by more than a factor of two, ranging from 40.4% to 46.1%. Note, however, that the difference between the "A" and "B" models in terms of attrition rates in the lowest 10% is not nearly as discrepant as it first appears, because the base rates are quite different for the "A" and "B" analysis samples.

As for the reference models, they outperform the "B" models across the board. The "A" models perform a bit better, although the advantage is not marked.

One other note: Much like for Physical/Medical attrition, one of the options for EOT item 35 showed substantial predictive power. Here, it was item 35d, an item endorsed by those who believe they might leave the Army in the next 6 months because of pregnancy. Because it was highly probable that many females who took the EOT surveys did so knowing they were pregnant, we excluded this item from the analysis. We believe the potential for criterion bias was much stronger with this item than with 35a. Therefore, although we permitted 35a to enter the models for predicting Medical/Physical attrition, we excluded 35d from all multivariate analysis of Pregnancy/Parenthood.

Summary

More differences in the attrition criteria became apparent in the multivariate prediction analyses. In addition to different variables being predictive of the various criteria, the degree to which we can predict them varies rather markedly, with Performance and Moral Character attrition being relatively more predictable than Pregnancy/Parenthood and Other attrition. The utility of the multivariate models appears quite healthy, but one must remember that these data come from a research setting. A large question remains about the degree to which such attitudinal variables would predict attrition should such a measure be used operationally. Of course, the Army would need to utilize the EOTB and EOTA data after selection had occurred. For Moral Character, Performance, and Medical/Physical attrition, however, the SRS data show substantial promise. They have relevance to the selection setting, and they predict unit attrition quite well. The more verifiable types of SRS data have a scent of Biodata to them. Perhaps this helps explain their predictive strength. The key, then, lies in their potential verifiability. With this additional factor at work, the SRS would seem to have substantial potential for helping identify individuals at greatest risk for several types of unit attrition.

Structural Models of Unit Attrition

We derived the multivariate regression models through empirical means. We turn now to the development and empirical testing of structural models of attrition—models based on

theoretical models of turnover from the civilian literature. As discussed in Chapter 4, structural models of attrition help the Army understand how predictors of attrition— (proximal and distal, administrative and survey-based) operate.

As in previous analyses presented in this chapter, the structural models of unit attrition consider all information available on Soldiers prior to their assignment to their units (i.e., "pre-unit" predictors—administrative variables and data from the SRS, EOTB, and EOTA surveys). The models presented in this chapter give us insight into what types of variables might serve as targets for Army interventions as Soldiers prepare to move from IET to their units. Structural modeling with in-unit data is presented later in the chapter.

Formulating a Preliminary Structural Model of Unit Attrition

As described in Chapter 4, the preliminary structural model of BCT attrition draws on the civilian turnover and industrial-organizational psychology research literatures, past military research on attrition, and current theorizing based on results observed over the course of the First Term research. The preliminary model for unit attrition necessarily contains additional components—variables assessed in the EOT surveys but not captured at reception. Figure 7.2 presents the preliminary structural model of unit attrition. The model shares many features with the core model from Chapter 4 (see Figure 4.1), with two differences. First, the variables that appear in both models were operationalized differently for the unit modeling process. Specifically, the most recent data were used as indicators of (or contributors to) these variables. For example, the EOTA composite for Generalized Self Efficacy was used rather than the composite from the SRS data. Second, the unit structural model contains additional variables: affective commitment (a six-item composite assessing one's emotional sense of belonging to the Army—pride in the uniform and organization), performance (a self-rated three-item composite in which Soldiers compare their effort, personal discipline, and overall effectiveness with that of other Soldiers), expectations (a single item assessing how realistic Soldiers believe their expectations about the Army were), and perceived fit with the Army (a two-item composite assessing the degree to which Soldiers believe they have the values and are the type of person the Army requires).

We began modeling unit attrition by fitting the model core to Overall attrition. By the model core, we mean the three most endogenous variables: Attrition Cognitions, Utility of Withdrawal, and Attrition. The key question involved the degree to which Attrition Cognitions and Utility of Withdrawal relate to Overall unit attrition in the Army. The unit Attrition Cognitions variable differed a bit from that used in the BCT analyses in Chapter 4. Specifically, of the three items constituting the SRS attrition cognitions composite, two were available on the EOT survey (how the Soldier's commitment to an Army career has changed, and confidence that the Soldier will complete the obligated service; the item assessing feelings about the Soldier's decision to enlist was specific to the SRS).

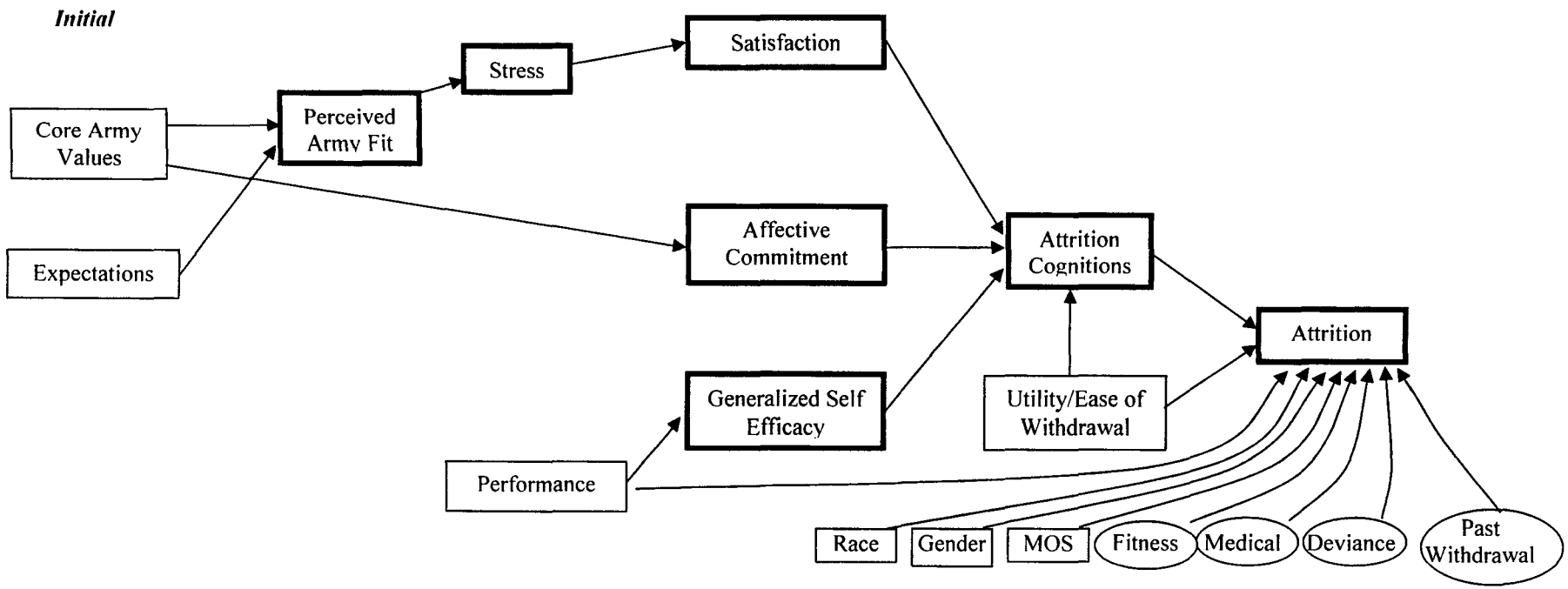


Figure 7.2. Initial Theory-Based Model of Unit Attrition

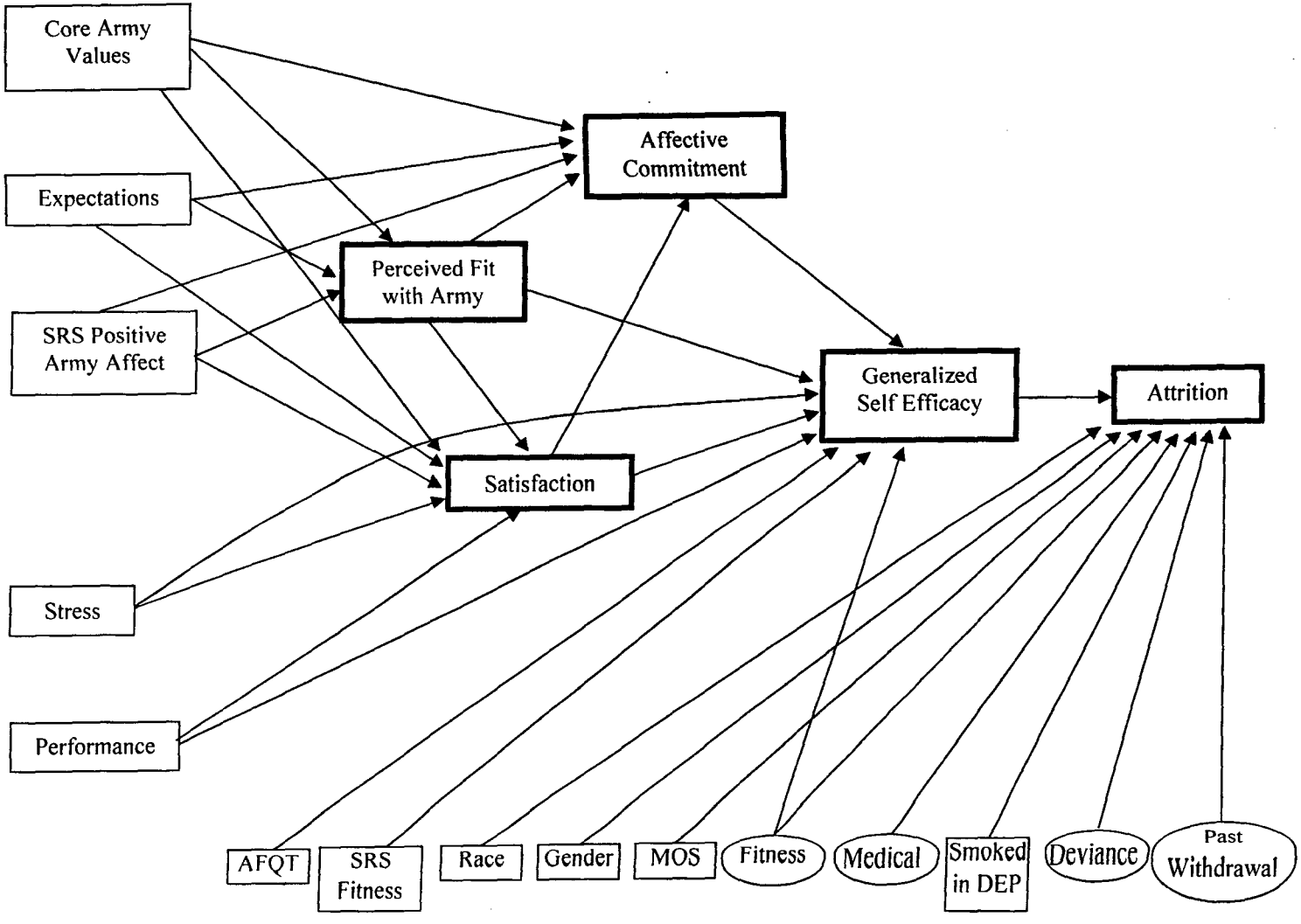


Figure 7.3. Final Model of Overall Unit Attrition

The results for the core model proved a bit disappointing: Although Attrition Cognitions did relate significantly to attrition, the effect was rather weak—especially to consider it a primary mediating variable for all preceding effects. The model *R* for Overall attrition was only .14. Subsequent efforts to model Overall attrition, therefore, removed Attrition Cognitions from the model. (As discussed in Chapter 4, however, the removal of Attrition Cognitions—although of theoretical interest—does not have great operational significance, given that this variable cannot be used to select Soldiers. Of greater import are the antecedents to such cognitions and attrition in general.)

Final Structural Model of Overall Attrition

Following several iterations, we developed a final model for Overall attrition. Table 7.19 shows the multiple *R* statistics that index the level of prediction obtained for each endogenous variable in the final Overall unit attrition model, and Figure 7.3 presents the model. The table shows that we achieved reasonable to sizable *R* estimates for most outcomes (i.e., endogenous variables). The fit statistics for the model appear in Table 7.20. For the Overall attrition model, the CFI and TLI indices are a bit lower than desired, but the RMSEA is acceptable (values less than .08 signify models with acceptable fit, whereas values less than .05 signify models with good fit).

Table 7.19. Multiple R Statistics for Endogenous Variables in Structural Models of Overall Attrition

Outcome	Overall
Overall Attrition	.35
Satisfaction	.75
Affective Commitment	.79
Generalized Self Efficacy	.74
Perceived Fit with Army	.63

Table 7.20. Model Fit Statistics for Structural Models of Unit Attrition

Criterion/Model	*df*	CFI	TLI	RMSEA
Overall Attrition	14	.902	.849	.071
Moral Character	7	.976	.950	.047

Note. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation.

Table 7.21 shows model parameter estimates and Wald statistics for the final structural model of overall attrition in each month of service. Because the path coefficients in the table are raw regression coefficients, they are difficult to interpret in terms of their relative magnitude to one another (within models).[49] Thus, we also present the Wald statistic for each path, which

[49] The path coefficients indexing the direct effect of variables on attrition are probit regression coefficients. M*plus* uses the probit rather than logit link function when modeling dichotomous outcome variables. The path coefficients indexing the effect of variables on the other endogenous variables (i.e., Attrition Cognitions, Generalized Self Efficacy, and Stress/Strain) are linear regression coefficients.

serves as a clearer indicator of the strength of the given path.[50] Results presented in Table 7.21 indicate that the variables with the strongest direct effects on Overall attrition were gender, Past Withdrawal Propensity, Medical, and smoking before DEP. The effects for race/ethnicity show a different pattern than in previous chapters. Specifically, blacks have a higher risk of attriting from the unit than do whites. The Medical component showed a strong effect, but as in the multivariate prediction model, part of this effect could be due to criterion contamination, stemming from Item 35h (might leave Army in the next 6 months because of illness/medical condition). Recall that Soldiers might know this information prior to their departure, resulting in artificially high relations between this item response and attrition. MOS had a direct effect on attrition, with Combat Arms Soldiers being significantly more likely to attrit than Combat Service Support Soldiers. Finally, although the direct effect of Generalized Self Efficacy on Overall attrition was significant, it remains relatively weak.

Table 7.21. Model Parameter Estimates and Wald Statistics for Final Structural Model of Unit Overall Attrition

Outcome/Predictor	*b*	*Wald*
Attrition		
Intercept	0.07	
Female	0.61	10.32
Past Withdrawal	0.16	9.18
Medical	0.11	6.87
42. Smoked before DEP	0.22	6.06
Deviance I: School Deviance	0.11	5.94
Race: Black	0.13	2.86
MOS: Combat Support	-0.05	-1.09
Race: Hispanic	-0.07	-1.10
Race: Other	-0.18	-2.04
Generalized Self Efficacy	-0.07	-2.86
Fitness	-0.06	-3.04
MOS: Combat Service Support	-0.24	-5.76
Generalized Self Efficacy		
Intercept	1.17	
Satisfaction	0.08	35.13
Perceived Fit with Army	0.21	28.58
AFQT	0.01	27.33
Affective Commitment	0.28	12.26
Performance	0.04	9.78
Stress/Strain	0.03	7.47
SRS Fitness	0.24	5.57

[50] The Wald statistic is calculated by dividing the path coefficient by its standard error. The statistic is asymptotically normally distributed (M=0, SD=1), and as such its significance can be assessed against the standard normal (z) distribution.

Table 7.21. (Continued)

Outcome/Predictor	*b*	*Wald*
Affective Commitment		
Intercept	0.34	
Satisfaction	0.33	58.69
Core Army Values	0.09	29.58
SRS Positive Army Affect	0.14	16.71
Perceived Fit with Army	0.11	11.95
7. How Has Army Life Compared to Expectations	0.07	11.72
5. Realistic Expectations about Army Life	0.04	5.43
Satisfaction		
Intercept	-4.15	
7. How Has Army Life Compared to Expectations	0.36	48.61
Core Army Values	0.14	31.54
5. Realistic Expectations about Army Life	0.20	18.63
Stress/Strain	0.07	13.83
Perceived Fit with Army	0.15	12.07
SRS Positive Army Affect	0.13	10.75
Performance	0.09	10.18
Perceived Fit with Army		
Intercept	0.95	
Core Army Values	0.17	70.68
SRS Positive Army Affect	0.12	12.62
7. How Has Army Life Compared to Expectations	0.06	9.86
5. Realistic Expectations about Army Life	0.08	9.61

Note. For each outcome, predictors are sorted in descending order by average magnitude of their Wald statistic across the first 2 months of service. Paths with Wald statistics that exceed 1.65 are statistically significant ($p < .05$, one-tailed).

Unlike the structural models for basic training attrition, the best predictors of Overall attrition in the units do not have readily apparent antecedents. Rather, the variables resemble those in the multivariate regression models, and many can be gleaned from the SRS. As such, these variables would likely be available to the Army as screening tools prior to enlistment. And, as mentioned in the multivariate prediction discussion, many of these items have a verifiable quality to them (e.g., past withdrawal behavior, school deviance).

Functioning of Demographic Variables

Recall that a secondary purpose in fitting our structural models was to gain a better understanding of how several demographic variables identified as potentially salient predictors of attrition in past research functioned. Our models provide insight into the functioning of gender, education tier, AFQT scores, race, and MOS. Our models indicated that gender had both direct and indirect (through GSE and stress/strain) effects on BCT attrition. The indirect effect was such that females tended to be less confident and report more stress/strain than males prior to training, which led to higher levels of attrition cognitions, and in turn, a higher risk of attrition. In our models, we hypothesized that education tier served as an indicator of Past Withdrawal

Propensity. As noted above, Past Withdrawal Propensity had one of the strongest direct effects on attrition. With regard to AFQT scores, our models revealed that they had no direct effect on attrition, only an indirect effect through GSE. Specifically, the indirect effect was such that Soldiers with high AFQT scores tended to be more confident, which led to lower levels of attrition cognitions, and in turn, a lower risk of attrition. Like AFQT scores, race had no direct effect on attrition, but did appear to affect it indirectly through its relationship with stress/strain. The indirect effect was such that minority Soldiers (blacks in particular) reported less stress/strain than white Soldiers, which led to lower levels of attrition cognitions, and in turn, a lower risk of attrition. Finally, with regard to MOS, our models indicated it had a direct effect on attrition (as described above).

Final Structural Model of Moral Character Attrition

Based on the results of our final structural models of overall BCT attrition, we formulated a structural model of Moral Character attrition. In light of the low correlation of Attrition Cognitions with Overall attrition, modeling efforts for Moral Character attrition began with the final model for Overall attrition rather than with the original model. In addition, we did not expect Attrition Cognitions to have a high correlation with Moral Character attrition, given that this type of attrition in particular appears to be involuntary (i.e., the Army decides to remove the individual from duty). Initial attempts to fit the model retained the entire external structure of the Overall attrition model (i.e., treating Satisfaction, Affective Commitment, and Generalized Self Efficacy as endogenous variables). The fit of this model was reasonably strong, but the fit belied the failure of the endogenous variables just mentioned to relate to Moral Character attrition. Because these variables failed to mediate the relations between more exogenous variables (e.g., Perceived Fit with the Army, Positive Army Affect) and attrition, we removed them from the middle of the model. Therefore, the final model (shown in Figure 7.4) contains far fewer variables than that for Overall attrition. Specifically, the model contains only two endogenous variables: attrition and perceived fit. The fit indices for this model outrace those for Overall attrition, but part of this increase in fit surely comes from this model being more saturated—that is, a higher proportion of the degrees of freedom are spent through parameter estimation.

As was the case with the structural models of Overall attrition, Table 7.22 shows that the structural model for Moral Character attrition was able to predict the endogenous variables well. Referring back to Table 7.20, we see that the fit statistics for this model are quite strong.

Table 7.22. Multiple R Statistics for Endogenous Variables in Structural Models of Moral Character Attrition

Outcome	Moral Character
Overall Attrition	.35
Perceived Fit with Army	.58

Results presented in Table 7.23 reveal the structural differences in the Moral Character attrition model. First, note that most of the predictors tap deviance behavior. Item SRS 42 and past withdrawal behaviors appear again, as does the Deviance I score (school deviance), but here the Deviance III score (received a moral waiver; Medical Failure: Drugs) enters the model. Not surprisingly, those who fit the Army better evidence a lower rate of Moral Character attrition. Note that the model contains no demographic variables.

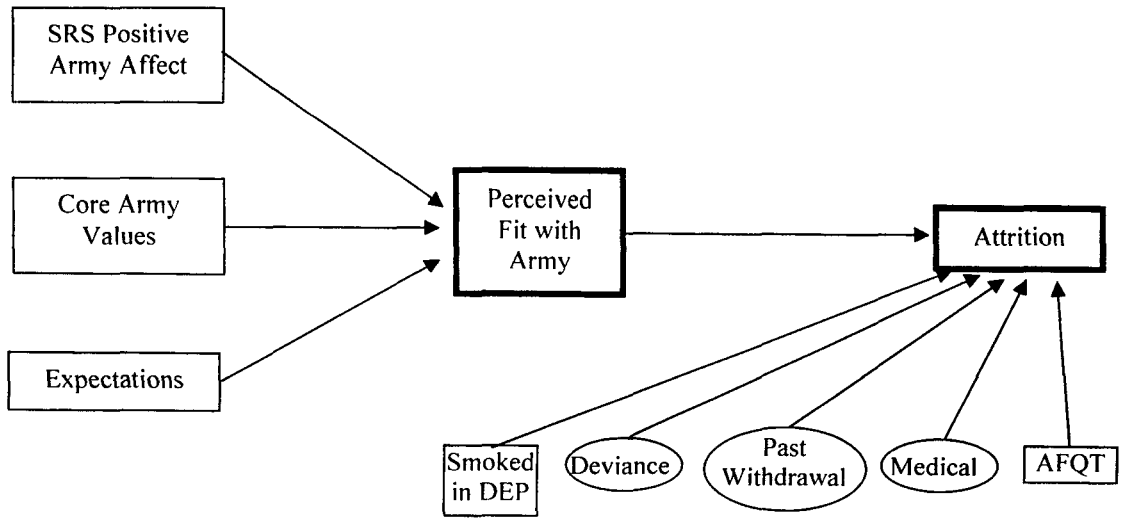


Figure 7.4. Final Model of Moral Character Unit Attrition

Table 7.23. Model Parameter Estimates and Wald Statistics for Final Structural Model of Unit Moral Character Attrition

Outcome/Predictor	*b*	*Wald*
Attrition		
Intercept	0.57	
Deviance I: School Deviance	0.20	9.12
Past Withdrawal	0.13	6.16
42. Smoked before DEP	0.26	5.99
Medical	0.08	4.29
Deviance III: Moral Waiver/Drugs	0.05	3.11
AFQT	-0.00	-3.56
Perceived Fit with Army	-0.11	-4.08
Perceived Fit with Army		
Intercept	1.40	
Core Army Values	0.17	60.99
SRS Positive Army Affect	0.11	11.25
5. Realistic Expectations about Army Life	0.08	8.96
7. How Has Army Life Compared to Expectations	0.05	7.83

Note. For each outcome, predictors are sorted in descending order by average magnitude of their Wald statistic across the first 2 months of service. Paths with Wald statistics that exceed 1.65 are statistically significant ($p < .05$, one-tailed).

As in the modeling efforts from previous chapters, we compared the predicted probabilities of attrition resulting from the structural models to those resulting from the multivariate models presented earlier. Again, our interest lay in determining (a) the extent to which the simpler structural models were able to capture variance in the more saturated, empirically driven predictive models; and (b) the degree to which the structural models could match the criterion-related validities of the predictive models. As before, we generated predicted probabilities of attrition based on variables having direct effects on attrition in our structural models,[51] and examined their correlation pattern with predicted probabilities resulting from the final predictive models, as well as attrition. In carrying out these analyses we were also able to examine how well models optimized for predicting Overall attrition predicted Moral Character attrition.

Table 7.24 shows correlations among different models' predicted probabilities for each attrition criterion *within* each month of service.

The table shows that the correlations among predicted values resulting from the structural and predictive models were not as high as those presented in Chapter 4. Thus, unlike the structural models for BCT attrition, the unit structural models simply do not account for as much variance in the more saturated multivariate prediction models.

[51] For each structural model, we entered the direct effects on attrition from that model into a logistic regression equation predicting the given type of attrition. The predicted probabilities from these analyses are what we refer to as predicted probabilities resulting from our structural models.

Table 7.24. Correlations Among Models' Predicted Probabilities of Attrition

	Attrition							
	Overall				Moral Character			
	SRS	EOTB	EOTA	SEM	SRS	EOTB	EOTA	SEM
SRS								
EOTB	.66				.60			
EOTA	.58	.69			.54	.68		
SEM	.75	.63	.62		.75	.49	.50	

Note. Correlations are between probabilities from first month models. SRS = Multivariate Predictive Model A from SRS; EOTB = Multivariate Predictive Model A from EOTB, EOTA = Multivariate Predictive Model A from EOTA, SEM = Final Structural Model (direct effects only). Overall n = 2,522 to 7,259. Moral Character n = 2,540 to 7,593. All correlations are statistically significant ($p < .05$, one-tailed).

For example, the correlation between predicted probabilities resulting from the structural model of Overall attrition and probabilities from the three maximum prediction models (one for each survey) indicate that the structural model accounted for between 36% and 56% of the variance in the predictive model. For Moral Character attrition, similar findings obtain, although there is even less covariation of the structural models with the predictive models obtained from the EOT surveys.

With regard to their validity for predicting attrition, Table 7.25 presents *c*-statistics for the structural and multivariate prediction models. The structural models do not perform quite as well as the multivariate models. Although the more saturated multivariate prediction models will experience more shrinkage upon cross-validation than will the simpler structural models, the amount of shrinkage should be relatively negligible given the large analysis samples used to derive the prediction equations.

Table 7.25. Comparison of Models' Performance Across Attrition Criteria

Overall	*df*	*c*	*Lower*	Upper
SRS	57	.692	.683	.701
EOTB	38	.684	.675	.693
EOTA	51	.704	.691	.716
SEM	14	.680	.665	.695
Moral Character				
SRS	50	.740	.728	.751
EOTB	45	.710	.698	.722
EOTA	40	.714	.702	.727
SEM	7	.703	.685	.721

Note. *df* = Model degrees of freedom (i.e., number of parameters estimated). *c* = *c*-statistic indexing the relationship between probabilities resulting from the given model and attrition criterion. Lower = Lower range of 95% confidence interval for *c*. Upper = Upper range of 95% confidence interval for *c*.

Analysis of the AS01 and AS02 Surveys with Implications for Managing Unit Attrition[52]

As noted in the previous sections, civilian models of attrition/turnover emphasize the role of Soldiers' attitudes and perceptions just prior to the separation behavior. The structural models just presented include attitudes and perceptions, but these are more distal than one might prefer, having been collected prior to unit assignment. Analyses of two surveys administered later in the first term allow us to evaluate the effects of attitudes and perceptions that form closer to the attrition event. Specifically, an annual survey assessing several constructs tapped by the SRS and EOT surveys, as well as new content, was administered on two occasions to Soldiers in their units. The first administration occurred some time after shipping the surveys on 1 March 2001 (the AS01 survey), and the second administration occurred some time after shipping the surveys on 15 March 2002 (the AS02 survey).

One major complication for analyzing data from the AS01 and AS02 surveys is that Soldiers completed the surveys at different points in time (perhaps some in March 2001, perhaps others in May 2001) and at different points in their first term. There are at least two ramifications of this administration schedule. First, Soldiers' risks of unit attrition vary as a function of when they completed each survey. Table 7.26 shows the attrition rate for Soldiers who had completed given amounts of their first term. As expected, the attrition rate decreases as the end of term approaches. Hence, all things being equal, unit attrition will be more predictable for Soldiers who have completed less of their first term than for those who have completed more. Second, because we do not have completion dates for either survey, we are unable to establish a meaningful zero point for modeling post-AS01 unit attrition over time. In our previous longitudinal models of attrition (e.g., AIT, unit EHA models), we "started time" when Soldiers entered that given phase of service, estimating Soldiers' dates of entry into each phase based on their accession date and mean training times for their MOS. This approach was infeasible for analysis of post-AS01/AS02 attrition because we lacked data on when Soldiers completed the AS01/AS02 surveys. Further, simply using the AS01/AS02 ship dates as starting times for longitudinal analysis of post-AS01/AS02 attrition would not be appropriate, because Soldiers completed these surveys at different points within the unit phase of their first term. Using the survey ship date as a baseline would not have addressed the problem of the survey being administered at different points in the Soldiers' careers—a problem not present with the previous surveys.[53]

Third, because the surveys were administered at different points in time during a Soldier's first enlistment, events that might have led to the Soldier's attrition (e.g., injury, arrest) might have occurred *before* the Soldier completed either the AS01 or AS02 survey, which could lead to an upward bias in predictive relations. Proximal data collection for attitudes and perceptions is ideal, but it could cause problems for certain other variables on the AS01 and AS02 surveys. For example, knowing that a new Soldier in the reception battalion thinks he/she might leave because of an inability to meet physical standards could be quite helpful for interventions. Once in unit, however, using such information for interventions becomes a bit more clouded. Consider a Soldier who failed the Physical Fitness Test and is facing discharge from the Army for failure to meet physical fitness standards. If this Soldier completed the AS01

[52] This section presents results of analyses conducted on unit attrition occurring after the ship date for the AS01 survey.
[53] For example, Soldiers who completed the EOT survey did so at the end of the training phases in their career (i.e., BCT, AIT or OSUT). In contrast, Soldiers completed the AS01 and AS02 at different points within the unit phase of their careers.

(or AS02) survey after receiving notice of the discharge but had yet to leave, the Soldier would almost certainly state he/she did not expect to complete the service obligation and would probably rate himself/herself lower on physical fitness than other Soldiers or report they might well be likely to leave the Army because of a failure to meet physical requirements. Similarly, a female Soldier might fill out the survey knowing she is pregnant and will have to leave the Army in the coming months. She would almost certainly indicate that she is unlikely to complete her term of obligation and might leave the Army because of pregnancy. The degree to which this occurred is uncertain, but the possibility of at least some of the sample filling out the AS01 and AS02 surveys in accordance with what they know will soon transpire should be recognized.[54]

Table 7.26. Attrition Rates by Percentage of First Enlistment Term Completed at Survey Ship Date

	AS01 Respondents			AS02 Respondents		
% of First Enlistment Term Completed as of Survey Ship Date	*n*	Attrition Rate	% of AS01 Attrition	*n*	Attrition Rate	% of AS02 Attrition
20.01 - 30.00	773	14.5	6.8			
30.01 - 40.00	3,777	14.2	32.6			
40.01 - 50.00	4,312	12.0	31.5	1,029	7.1	13.3
50.01 - 60.00	4,170	8.9	22.6	943	5.5	9.5
60.01 - 70.00	1,030	6.4	4.0	4,419	5.7	45.5
70.01 - 80.00	1,076	3.6	2.4	2,378	4.8	20.8
80.01 - 90.00	146	1.4	0.1	3,184	1.6	9.3
90.01 - 100	20	0.0	0.0	912	1.0	1.6
Totals	15,304	10.8	100.0	12,865	4.3	100.0

Notes. For AS01, the correlation between % of first enlistment term completed and attrition was -.11 (n = 15,304). For AS02, the correlation between % of first enlistment term completed and attrition was -.10 (n = 12,865).

To provide some context regarding the extent of possible variation in Soldier experience when completing the AS01 and AS02, consider that the FY99 cohort comprises Soldiers who entered the Army from 1 October 1998 to 30 September 1999. As of 1 March 2001 (i.e., the AS01 ship date), Soldiers entering during October 1998 would have completed 2 years and 5 months of their first enlistment, whereas Soldiers entering during September 1999 would have completed just 1 year and 6 months. Of the 53,176 Soldiers having unit attrition data, 52,994 have data signifying their enlistment term, and 38.5% of them have either 2-year (2.2%) or 3-year (36.3%) enlistments. Therefore, a small percentage of the FY99 cohort did not have a chance to take the AS01, and a significant number of those who did complete the survey would have been near the end of their enlistment term. On the other hand, Soldiers who entered near the end of FY99 but contracted for 4-year (47.7%) or 6-year (8.3%) enlistments would have completed the survey with more than half of their enlistment time yet to serve.

This survey timing issue is a much greater problem for the AS02. All Soldiers with initial enlistments of 2 years (barring extensions), and approximately half of those Soldiers with 3-year enlistments, had completed their first term by the time of AS02 administration. Similarly, for the bulk of the unit analysis sample (i.e., those having 4-year enlistments), approximately half of those

[54] This situation could also affect results from the EOT surveys (particularly the EOTA survey), but (a) IET has a shorter duration than a unit assignment, and (b) fewer Soldiers attrited from IET than from the unit.

who completed the AS02 survey would have less than 1 year of service remaining. Note that these figures assume administration at the time of survey shipment. We know there was some lag between the March shipping dates and survey completion. Hence, the situation just described is conservative in terms of its effect on the makeup of the AS01 and AS02 samples. Given the low attrition rates among Soldiers who were near the end of their enlistment term, our correlational and modeling analyses excluded from the AS01 analyses all Soldiers with 2-year enlistment terms. Similarly, Soldiers with enlistment terms of 2 or 3 years were excluded from the AS02 analyses.

In sum, Soldiers who completed the surveys varied widely in terms of how long they had been in their units and how much time remained in their enlistment terms. The varied timing of survey distribution across posts exacerbated this problem. In short, the research design departed significantly from the preferred approach where Soldiers would have taken the survey at approximately the same points in time during their first enlistment terms (e.g., one month after entering their units), and any attempt to estimate a survey completion date could be in error by a margin of several months.

Despite the various difficulties just presented, the AS01 and AS02 data provide the best means of testing the degree to which proximal attitudes and perceptions relate to attrition behavior in the Army. As discussed previously, Attrition Cognitions did not appear in either model of unit attrition (see Figures 7.3 and 7.4) despite the predictions of theory (see Figure 7.2)—a result likely due to the amount of time between Soldiers completing the EOT survey(s) and attriting from their units. The more current AS01 and AS02 survey responses will allow a more powerful test of the theoretical proposition that intentions (i.e., Attrition Cognitions) are the best predictor of future behaviors (unit attrition). In addition, these data provide us with a foundation upon which we might build recommendations for interventions or countermeasures aimed at reducing unit attrition. If Soldier attitudes and perceptions that did not predict unit attrition when assessed prior to unit assignment do predict unit attrition when assessed during unit assignment, we will have identified other attitudes and perceptions the Army might wish to address that otherwise would go undetected by surveys administered earlier in Soldiers' enlistments.

Incidence and Composition of Unit Attrition

Incidence

Table 7.27 shows that the base rate of unit attrition was 27.5% (i.e., 27.5% of Soldiers who completed IET and entered a unit attrited from their units). Combining information from Tables 7.27 (14,609 Soldiers attrited from their units) and 3.1 (21,813 Soldiers attrited from the overall attrition sample), we see that unit attrition accounted for 67.0% of all first-term attrition. More than half of all unit attrition (52.3%) occurred prior to the AS01 ship date of 1 March 2001 and nearly 90% (86.6%) had occurred prior to the AS02 ship date of 15 March 2002. As a result, the base rates of attrition for analyses of the AS01 and AS02 surveys were quite a bit lower than for the unit attrition analyses reported previously: 15.3% for Soldiers surviving through the AS01 ship date and 4.8% for Soldiers surviving through the AS02 ship date (see Table 7.27). As expected, the probability of attrition decreased sharply as Soldiers neared the end of their enlistment terms.

Table 7.27. Attrition Base Rates for AS01 and AS02 Unit Attrition Samples

Sample/Respondents	Total Sample						Survey Respondents			
	In-Service	Attrit	Attrit Rate (%)	% of Overall Attrition	% Post AS01 Ship Date	% Post AS02 Ship Date	In-Service	Attrit	Attrit Rate (%)	% of Overall Attrition
Full Unit Sample										
Overall Attrition	38,567	14,609	27.5		47.7	13.4				
Moral Character Attrition	38,567	6,753	14.9	46.2	61.5	15.2				
Pregnancy/Parenthood Attrition	38,567	1,621	4.0	11.1	57.5	20.7				
Performance Attrition	38,567	1,983	4.9	13.6	14.1	4.9				
Medical/Physical Attrition	38,567	2,256	5.5	15.4	34.8	12.6				
Other Attrition	38,567	1,996	4.9	13.7	41.1	10.7				
AS01 Sample/Respondents										
Overall Attrition	38,567	6,968	15.3				13,701	1,654	10.8	
Moral Character Attrition	38,567	4,152	9.7	59.6			13,701	824	5.7	49.8
Pregnancy/Parenthood Attrition	38,567	932	2.4	13.4			13,701	278	2.0	16.8
Performance Attrition	38,567	280	0.7	4.0			13,701	93	0.7	5.6
Medical/Physical Attrition	38,567	784	2.0	11.3			13,701	251	1.8	15.2
Other Attrition	38,567	820	2.1	11.8			13,701	208	1.5	12.6
AS02 Sample/Respondents										
Overall Attrition	38,567	1,960	4.8				13,210	549	4.0	
Moral Character Attrition	38,567	1,028	2.6	52.4			13,210	255	1.9	46.4
Pregnancy/Parenthood Attrition	38,567	336	0.9	17.1			13,210	102	0.8	18.6
Performance Attrition	38,567	97	0.3	4.9			13,210	30	0.2	5.5
Medical/Physical Attrition	38,567	285	0.7	14.5			13,210	97	0.7	17.7
Other Attrition	38,567	214	0.6	10.9			13,210	65	0.5	11.8

Note. Base rates of Pregnancy/Parenthood Attrition among females only are as follows: Full unit sample (20.6%), AS01 sample (12.9%), AS01 respondents (12.2%), AS02 sample (4.9%), and AS02 respondents (4.4%).

Composition

Table 7.27 shows that most instances of unit attrition (46.2%) involved issues of moral character (e.g., discharge in lieu of courts martial, drugs). In the AS01 and AS02 analysis samples, the proportion of attrition attributable to moral character was even higher (59.6% and 52.4%, respectively).

With regard to differences in the types of attrition that occurred prior to and after the shipping date for the AS01, the largest difference regarded attrition due to performance and moral character. For example, 85.9% of unit attrition attributed to performance-related ISCs occurred prior to administration of the AS01 survey, whereas only 38.5% of unit attrition attributed to moral-character-related ISCs occurred prior to AS01 administration.

Response Rate and Characteristics of the AS01/AS02 Respondents

Response rates for the AS01 and AS02 were quite similar. Specifically, 33.7% of Soldiers who survived until the AS01 ship date responded to the AS01 survey. The average AS01 respondent had completed 48.4% of his/her enlistment term as of the AS01 ship date, although

there was substantial variation in this total (SD = 12.7). This figure translated into an average of 645 days of service (SD = 103). By comparison, 34.0% of Soldiers who survived through the AS02 ship date responded to the AS02 survey. The average AS02 respondent had completed 71.4% of his/her enlistment term as of the AS02 ship date (again with substantial variation in this total: SD = 13.5), translating into an average of 1,018 days of service (SD = 100).

AS01 respondents had a notably lower unit attrition rate (10.8%) than did non-respondents who survived through the AS01 ship date (17.6%). For the AS02 survey, the difference in unit attrition rates between respondents and non-respondents was smaller (4.0% vs. 5.3%).

Correlates of Post AS01/AS02 Unit Attrition

The findings reported here are based on consideration of hundreds of Project First Term survey variables spanning all surveys examined in this report (i.e., SRS, EOTB, EOTA, AS01, AS02). We also considered Soldiers' demographic and administrative data such as gender, education tier, and AFQT score.

Post-AS01 Attrition

Table 7.28 lists the top correlates of post-AS01 attrition (all zero-order correlations with absolute values greater than or equal to .10). The table shows that the strongest correlates tended to be AS01 variables that are attitudinal in nature and reflect Soldiers' interactions with their unit environment. Examples of such variables include the following:

- AS01: Confident you will complete your term of obligation
- AS01: Important to complete obligation
- AS01: Affective Commitment
- AS01: Satisfaction with Army life
- AS01: Efficacy for Performance
- AS01: Perceived fit with the Army
- AS01: Importance of Core Army Values "Loyalty" and "Selfless Service"

The most predictive variables not on the AS01 survey included the administrative variable gender (Female), SRS: Non-school-related Deviance, EOTB: Medical problems during training, and SRS42: How often did you smoke prior to DEP? Of these non-AS01 survey variables, only gender (female = 1, male = 0) showed a correlation of .10 or larger (in absolute value).

An important feature of Table 7.28 is that attitudes and perceptions of the Army formed during IET (i.e., those captured by early Project First Term surveys) were not among the top predictors of post-AS01 attrition. This finding agrees with what theory dictates for at least two reasons. First, all else being equal, the attitudes most salient to predicting attrition will be those captured closest in time to the attrition event. Second, the attitudes captured by the AS01 survey reflect Soldiers' experiences while in their units, whereas earlier surveys capture attitudes that reflect experiences in IET and prior to entry. Therefore, the AS01 survey captures attitudes and perceptions of greater relevance to predicting unit attrition than are those attitudes captured at earlier points in time.

Table 7.28. Correlates of Post-AS01 Overall Unit Attrition

Variable	*n*	*r*	*c*
AS01 Component: Attrition Cognitions	14,800	.33	.702
AS0109b:Confident Complete your term of obligation	14,877	-.29	.696
AS01 Component: Deviance	14,759	.28	.694
AS01: Item 38 Years of Active Duty Expected to Complete is Less than Enlistment Term (1=Yes, 0 = Other)	14,920	.26	.595
AS01 Efficacy for Performance	14,941	-.23	.680
AS0125:Serious trouble since training	14,888	.23	.636
AS01 Possible Reasons for Leaving Army - Deviance	14,882	.22	.624
AS0136:Important to complete obligation	14,947	-.22	.662
AS0126d:Serious (UCMJ) offenses	14,844	.22	.590
AS01 Possible Reasons for Leaving Army - All Reasons	14,948	.20	.666
EOTA19:Was this person in your unit?	97*	.20	.605
AS0117:Type Army wants as Soldier	14,655	-.18	.646
AS01 Performance Self Efficacy (sans 9b and 9c)	14,915	-.18	.653
AS01 Perceived Fit with Army	14,896	-.18	.651
AS0116b:Personal Discipline vs. others	14,919	-.18	.642
AS0126e:Minor offenses	14,836	.17	.585
AS0109e:Earn promotions in the Army	14,820	-.17	.635
AS01 Job Performance (self-rated)	14,940	-.16	.638
AS01 Component: Positive Army Affect	14,588	-.16	.639
AS0109a:Confident Adapt to Army life	14,887	-.16	.635
AS01 Importance of Core Army Values - Loyalty and Selfless Service	14,942	-.14	.619
AS01 Affective Commitment	14,970	-.14	.626
AS0113k:Satisfied-Length of enlistment	14,912	-.14	.620
AS0109c:Confident Maintain required fitness	14,849	-.14	.601
AS0116d:Overall Effectiveness vs. others	14,856	-.14	.613
AS01 Physical Fitness	14,993	-.14	.606
AS0135:Disappointed if I dropped out	14,910	-.14	.610
AS01 Satisfaction with Army Life	15,001	-.13	.620
AS0111fr:Frequently feel like leaving Army (reversed)	14,912	-.13	.625
AS0114b:Loyalty to unit or organization	14,912	-.13	.610
AS01: Item 37 Definitely Leave After Obligation (1=Yes, 0 = Other)	14,924	.13	.601
AS0114a:Loyalty to U.S. Army	14,917	-.13	.605
AS0126j:Drug/alcohol abuse	14,825	.13	.554
AS0114e:Dedication to serving US	14,903	-.13	.599
AS0123:Level of strain, conflict or stress	14,869	-.12	.620
AS0109d:Skills to perform well next	14,849	-.12	.597
AS0115:Personal values match Army values	14,746	-.12	.603
AS0114d:Good for many before own welfare	14,910	-.12	.597
AS0126k:Mental health problems	14,790	.12	.557
AS01 Continuance Intentions	14,973	-.12	.623
AS0112o:Proud to be a member of my unit	14,770	-.12	.602
AS01 Pride in Unit	14,806	-.12	.603
AS0113b:Satisfied-NCO relationships	14,921	-.12	.593
AS0111j:Strong sense of belonging in Army	14,931	-.12	.600
AS0114j:Disciplined & courageous in battle	14,903	-.11	.584
AS0116a:Effort vs. others	14,930	-.11	.592
AS0113n:Satisfied-Life as enlisted Soldier	14,886	-.11	.598
AS01 Satisfaction with Supervision - Leader Support	14,994	-.11	.600

Table 7.28. (Continued)

Variable	*n*	*r*	*c*
AS 0111i:Army has great personal meaning	14,913	-.11	.595
AS 0108:Commitment to Army career changed	14,881	-.11	.601
AS 0111cr:Discourage friend from joining (reversed)	14,927	-.11	.601
AS 0137:Active duty Army career intentions	14,924	-.11	.611
AS01 Importance of Core Army Values - Duty, Integrity, and Personal Courage	14,950	-.11	.595
AS 0114p:Physical fitness & stamina	14,902	-.11	.581
AS 0114m:Military bearing & appearance	14,893	-.11	.585
AS 0124:Current level of morale	14,885	-.11	.594
AS 0126a:Fail to meet physical requirements	14,854	.11	.556
AS 0138:Years active service expected	14,920	-.11	.597
AS 0118f:Performance evaluated fairly	14,873	-.11	.592
AS 0114f:Commitment to work as team member	14,890	-.10	.581
AS 0107:Health now vs. when you entered	14,914	-.10	.586
AS 0132:Army develop personal character	14,464	-.10	.581
AS 0111g:Proud to tell I am in the Army	14,938	-.10	.584
AS 0110e:Unfair military justice system	12,345	.10	.588
AS 0116c:Physical Fitness vs. others	14,902	-.10	.585
AS 0112n:I play important part in mission	14,778	-.10	.580
AS 0126c:Pregnancy	14,788	.10	.544
AS 0104:Army life versus expectations	14,906	-.10	.591
AS 0114h:Personal drive to succeed	14,896	-.10	.573
AS 0113j:Satisfied-Structured lifestyle	14,918	-.10	.585
AS 0134:Army support for family	10,017	-.10	.584
AS01 Satisfaction with Coworkers	14,947	-.10	.584
CD DMDC: % of Enlistment Term Completed at AS01 Start Date (3-1-01)	15,001	-.10	.589
AS 0111n:Part of the family	14,942	-.10	.586
CD: Female (dummy variable)	15,001	.10	.554

Note. The low response rate obtains because this question regards sexual harassment.

A notable exception to the preponderance of attitudinal variables was the role of Deviance. Soldiers who (a) reported getting into trouble since training, (b) thought they might leave for disciplinary reasons, or (c) believed their supervisor would give them a low rating on personal discipline (e.g., willingness to follow orders, display of respect for superiors) attrited at notably higher rates than Soldiers who did not.

Correlations with Various Post-AS01 Attrition Criteria. Table 7.29 shows the top correlates for various types of post-AS01 attrition. This table is similar to Table 7.6 in that it presents adjusted correlations to facilitate comparison across criteria with different base rates of attrition. The table contains all predictors that evidenced at least one adjusted correlation of .20 or greater with one of the attrition criteria. Values that had *unadjusted* correlations of .05 or greater are shaded.

The primary feature of the table is the dominance of AS01 variables. Table 7.29 also shows the differential patterns of correlation between the various predictors and the different types of attrition. For example, Deviance was the single strongest predictor of moral-character attrition and among the strongest predictors of post-AS01 overall attrition, but it did not correlate

highly with other types of attrition. Similarly, many of the attitudes that were most predictive of overall and moral-character attrition were not nearly as predictive of other forms of attrition. The three "completion of obligation variables" (confidence for completing obligation, expecting to complete obligation, and importance of completing obligation) prove the exception to this trend—a finding that (a) is consistent with theory and with our modeling efforts (summarized below), and (b) suggests these variables would be more proximal to attrition than other more general attitudes.

Table 7.29. Adjusted Point-Biserial Correlations Between Different Types of Post-AS01 Attrition and Top Predictors

	Type of Attrition					
Predictor	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
Administrative Variables						
Medical Failure: Weight (C2MFAILx)	0.08	-0.01	0.08	0.24	0.00	0.01
Center for Disease Control BMI Category	0.02	-0.03	0.10	0.23	-0.04	-0.02
Raw Body Mass Index (BMI) (C2HGT and CWEIGHT)	0.02	-0.03	0.11	0.27	-0.05	-0.03
SRS Items						
41:Length of enlistment term?	0.15	0.06	0.04	0.13	0.21	0.13
Deviant I- School Deviance (New)	0.13	0.22	0.10	0.00	0.04	-0.05
Trouble in School	0.13	0.20	0.07	0.00	0.09	-0.02
EOTB Items						
35a:Fail physical requirements	0.11	0.02	0.15	0.22	0.00	-0.01
31c:Confident-meet physical req.	-0.10	0.02	-0.14	-0.21	-0.04	-0.01
EOTB Composites						
Physical Fitness	-0.12	0.02	-0.13	-0.22	-0.06	-0.03
AS01 Items						
09b:Confident Complete your term of obligation	-0.47	-0.32	-0.37	-0.43	-0.39	-0.26
38:Years of Active Duty Expected to Complete is Less than Enlistment Term (1=Yes, 0 = Other)	0.42	0.29	0.29	0.43	0.39	0.29
25:Serious trouble since training	0.37	0.47	0.23	0.07	0.05	0.16
36:Important to complete obligation	-0.35	-0.23	-0.24	-0.28	-0.37	-0.19
26d:Serious (UCMJ) offenses	0.35	0.45	0.23	0.06	0.01	0.17
17:Type Army wants as Soldier	-0.30	-0.23	-0.22	-0.22	-0.17	-0.18
16b:Personal Discipline vs. others	-0.28	-0.27	-0.26	-0.17	-0.07	-0.14
26e:Minor offenses	0.28	0.35	0.22	0.08	-0.03	0.13
09e:Earn promotions in the Army	-0.27	-0.20	-0.23	-0.25	-0.17	-0.14
09a:Confident Adapt to Army life	-0.26	-0.18	-0.17	-0.19	-0.22	-0.13
13k:Satisfied-Length of enlistment	-0.23	-0.14	-0.17	-0.16	-0.27	-0.14
09c:Confident Maintain required fitness	-0.22	-0.07	-0.28	-0.36	-0.14	-0.07
16d:Overall Effectiveness vs. others	-0.22	-0.17	-0.22	-0.18	-0.10	-0.09
35:Disappointed if I dropped out	-0.22	-0.10	-0.11	-0.20	-0.26	-0.13
11fr:Frequently feel like leaving Army (reversed)	-0.22	-0.16	-0.14	-0.14	-0.18	-0.11
14b:Loyalty to unit or organization	-0.21	-0.17	-0.17	-0.14	-0.13	-0.09
37:Definitely Leave After Obligation (1=Yes, 0 = Other)	0.21	0.13	0.16	0.17	0.27	0.14
14a:Loyalty to U.S. Army	-0.21	-0.17	-0.16	-0.14	-0.14	-0.07
26j:Drug/alcohol abuse	0.21	0.30	0.02	0.03	-0.01	0.06
14e:Dedication to serving US	-0.21	-0.15	-0.17	-0.12	-0.12	-0.07
23:Level of strain, conflict or stress	-0.20	-0.15	-0.13	-0.14	-0.11	-0.13
09d:Skills to perform well next	-0.20	-0.12	-0.16	-0.17	-0.15	-0.10
15:Personal values match Army values	-0.20	-0.20	-0.13	-0.12	-0.03	-0.12
26k:Mental health problems	0.19	0.16	0.05	0.22	0.06	0.16

Table 7.29. (Continued)

Predictor	Type of Attrition					
	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
16a:Effort vs. others	-0.18	-0.14	-0.21	-0.14	-0.09	-0.10
37:Active duty Army career intentions	-0.18	-0.10	-0.12	-0.15	-0.25	-0.11
26a:Fail to meet physical requirements	0.17	0.03	0.34	0.39	0.08	0.00
38:Years active service expected	-0.17	-0.11	-0.09	-0.14	-0.24	-0.10
16c:Physical Fitness vs. others	-0.16	-0.03	-0.27	-0.29	-0.13	-0.02
26c:Pregnancy	0.16	0.03	0.00	-0.01	0.34	-0.03
as0126i:Meeting weight standards	0.10	0.01	0.11	0.35	-0.02	0.02
AS01 Composites						
Attrition Cognitions	0.54	0.38	0.43	0.53	0.46	0.35
Deviance	0.45	0.55	0.32	0.14	0.06	0.21
Efficacy for Performance	-0.37	-0.23	-0.31	-0.36	-0.28	-0.18
Possible Reasons for Leaving Army - Deviance	0.36	0.47	0.20	0.07	-0.02	0.15
Possible Reasons for Leaving Army - All Reasons	0.32	0.29	0.24	0.22	0.17	0.13
Performance Self Efficacy (sans 9b and 9c)	-0.30	-0.21	-0.23	-0.25	-0.22	-0.15
Perceived Fit with Army	-0.29	-0.25	-0.21	-0.20	-0.13	-0.18
Job Performance (self-rated)	-0.26	-0.23	-0.26	-0.19	-0.10	-0.13
Positive Army Affect	-0.26	-0.19	-0.19	-0.19	-0.23	-0.14
Importance of Core Army Values - Loyalty and Selfless Service	-0.23	-0.19	-0.19	-0.14	-0.15	-0.09
Affective Commitment	-0.23	-0.17	-0.15	-0.15	-0.18	-0.11
Physical Fitness	-0.22	-0.06	-0.31	-0.37	-0.15	-0.05
Satisfaction with Army Life	-0.22	-0.16	-0.16	-0.16	-0.21	-0.12
Continuance Intentions	-0.19	-0.12	-0.12	-0.16	-0.27	-0.11

Note. Values in cells are adjusted correlations (Kemery et al., 1988) and assume an attrition base rate of .50. Within each category, predictors are sorted in descending order by value of their correlation with Overall attrition (q.v., Table 3.4). Correlations are highlighted if their unadjusted value is at least .05 in magnitude. Correlations for Pregnancy/Parenthood are based on females only.

Variables related to physical fitness (namely, confidence for meeting physical requirements of the Army, self-rated physical fitness, and thinking one might leave because of failure to meet physical requirements) were among the strongest predictors of Performance and Physical/Medical attrition.[55] Weight-related variables (body mass index, receipt of a medical failure for weight at entry into service, and thinking one might leave because of failing to meet weight standards) also were among the strongest predictors of Physical/Medical attrition.

Historically salient predictors of attrition (e.g., gender, education tier, AFQT) were not among the strongest correlates of post-AS01 attrition.[56] This is not to say they were unrelated to attrition. Rather, their relationships paled in comparison to those for predictors with greater theoretical significance (such as those discussed above). Previous attrition research has tended not to capture these latter types of predictors (i.e., attitudinal and intentional variables), leaving the "administrative variables" to hold sway.

[55] Medical/Physical attrition primarily reflects two ISCs: medically unqualified for active duty, and failure to meet weight or body fat standards.

[56] AFQT appeared to influence attrition primarily through self-rated performance and confidence for performing well in the Army.

The relation between gender and post-AS01 attrition depended heavily on the type of attrition examined. For example, men were significantly *more* likely to attrit for reasons of moral character than were women. On the other hand, nearly all parenthood attrition (79.5%) and all of pregnancy attrition (of course) occurred among females. For other types of attrition, relations with gender were less substantial. Thus, the finding that women were more likely to attrit than men when using overall unit attrition as a criterion appears to be largely due to this criterion including attrition due to pregnancy/parenthood.[57]

Post-AS02 Attrition

Table 7.30 presents the top correlates of overall attrition occurring after shipment of the AS02 survey (all zero-order correlations with absolute values greater than or equal to .10). The table shows that variables related to deviance (e.g., AS02 Deviance, Serious trouble since training, Possible Reasons for Leaving Army – Deviance, Serious [UCMJ] offenses) correlated most highly with post-AS02 attrition. Other important predictors assessed expected enlistment time (e.g., Years of Active Duty Expected to Complete is Less than Enlistment Term, Years of Active Service Expected, Continuance Intentions), fit with the Army (Type Army Wants as a Soldier, Unit Leadership Supportive of Re-enlisting, Personal Values Match Army), and positive feelings for the Army (Affective Commitment, Importance of Core Army Values - Loyalty and Selfless Service, Disappointed if I Dropped Out of Army, Loyalty to U.S. Army, Proud to Be a Member of Unit, Loyalty to Unit or Organization). Again, we see that proximal intentions to complete one's enlistment, current attitudes toward the Army, and deviant behavior are key indicators of attrition later in a Soldier's first term of enlistment.

Correlations with Various Post-AS02 Attrition Criteria. The adjusted correlations for the top predictors of the various post-AS02 attrition criteria appear in Table 7.31. The table contains all predictors that evidenced at least one adjusted correlation of .25 or greater with one of the attrition criteria. Values that had *unadjusted* correlations of .05 or greater are shaded.

As expected, we again see the largest concentration of predictors coming from the most proximal survey (AS02). For this table, the Performance and Other attrition criteria were relatively difficult to predict well, although four items from the EOTB survey regarding the importance of behaviors and values the Army holds in high regard exhibited adjusted correlations between -.25 and -.40 with Performance attrition. Indeed, relative to the post-AS01 attrition results given in Table 7.29, many more items from earlier surveys make an appearance in the table. The patterns of correlations are consistent with those reported for post-AS01 attrition.

[57] Based on ISCs, 11.1% of overall unit attrition was attributable to reasons of pregnancy and parenthood.

Table 7.30. Correlates of Post-AS02 Overall Unit Attrition

Variable	*n*	*r*	*c*
AS02: Item 45:Years of Active Duty Expected to Complete is Less than Enlistment Term (1=Yes, 0 = Other)	9,473	.32	.652
AS02 Component: Deviance	9,236	.23	.705
AS 0228:Serious trouble since training	9,416	.19	.645
AS02 Possible Reasons for Leaving Army - Deviance	9,422	.18	.624
AS 0227e:Serious (UCMJ) offenses	9,411	.18	.595
AS 0239:Important Complete enlistment obligation	9,422	-.18	.664
EOTA18:Who sexually harassed you?	65*	.17	.627
AS02 Perceived Fit with Army	9,350	-.16	.673
AS 0227f:Minor offenses	9,406	.15	.591
AS 0216:Type Army wants as Soldier	9,157	-.15	.652
AS 0215b:Personal Discipline vs. others	9,355	-.13	.646
AS 0237:Unit leadership supportive of re-enlisting	9,415	-.13	.639
AS 0214:Personal values match Army	9,255	-.13	.634
EOTA20:Report the sexual harassment?	65*	-.12	.605
AS02 Self-rated Performance	9,364	-.12	.635
AS 0245:Years active service expected	9,473	-.12	.675
AS02 Continuance Intentions	9,502	-.12	.687
AS01 Component: Deviance	3,695	.11	.657
AS02 Affective Commitment	9,481	-.11	.634
AS 0235:Disappointed if I dropped out of Army ?	9,434	-.11	.630
AS 0227l:Drug/alcohol abuse	9,407	.11	.560
AS02 Component: Positive Army Affect	9,333	-.11	.636
AS02 Importance of Core Army Values - Loyalty and Selfless Service	9,471	-.11	.614
AS 0213d:Good for many before own welfare	9,457	-.11	.606
AS 0213a:Loyalty to U.S. Army	9,464	-.11	.603
AS02 Satisfaction with Supervision - Leader Support	9,509	-.10	.625
AS 0227m:Mental health problems	9,404	.10	.557
AS 0207e:Earn promotions in the Army	9,399	-.10	.617
AS 0222:Level of strain, conflict or stress	9,363	-.10	.639
AS 0211r:Proud to be a member of unit	9,438	-.10	.617
AS 0215d:Overall Effectiveness vs. others	9,327	-.10	.604
AS 0244:Active duty Army career intentions	9,488	-.10	.637
AS 0126c:Pregnancy	3,704	.10	.559
AS 0213b:Loyalty to unit or organization	9,456	-.10	.611
AS 0217f:Performance evaluated fairly	9,453	-.10	.612
AS02 Performance Self Efficacy (sans 7a, 7c, 7f)	9,468	-.10	.612
AS 0209j:Strong sense of belonging	9,452	-.10	.612
AS02 Efficacy for Performance	9,484	-.10	.616

Note. The low response rate obtains because this question regards sexual harassment.

Table 7.31. Adjusted Point-Biserial Correlations Between Different Types of Post-AS02 Attrition and Top Predictors

	Type of Attrition					
Predictor	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
AIM						
AIM: Physical Condition	-0.11	-0.10	-0.02	**-0.29**	0.06	0.02
Administrative						
Medical Failure: Weight	0.08	-0.01	0.10	**0.38**	-0.02	-0.04
Center for Disease Control BMI Category	0.05	0.01	0.06	**0.29**	0.00	0.01
SRS Single Items						
23:Were you ever expelled	**0.16**	**0.22**	-0.05	**0.32**	-0.08	0.00
35:Average fitness level before Army	-0.09	-0.02	-0.12	**-0.26**	0.00	-0.07
54c:Career goals are unclear	0.05	0.04	**0.29**	0.04	0.05	0.04
SRS Composites						
Deviant I - School Deviance (New)	**0.13**	**0.25**	0.00	**0.18**	-0.01	-0.11
EOTB Single Items						
32j:Being courageous	-0.06	-0.05	**-0.33**	-0.05	-0.03	0.01
32p:Physical fitness and stamina	-0.04	-0.01	**-0.27**	-0.07	-0.01	0.05
32c:Taking responsibility for actions	-0.03	-0.03	**-0.38**	0.00	0.02	0.00
32m:Exhibiting excellent appearance	-0.06	-0.05	**-0.33**	-0.05	-0.03	0.01
EOTB Composites						
Importance of Core Army Values - Duty, Integrity, and Personal Courage	-0.01	-0.03	**-0.29**	0.00	0.02	0.05
EOTA Items						
35u:Mental health problems	0.08	0.10	**0.29**	0.04	0.05	0.03
16:Get into serious trouble?	0.08	0.03	-0.04	**0.16**	0.27	0.00
21f:Discrimination? Yes-other	0.05	0.01	-0.04	**0.32**	-0.06	0.03
21c:Discrimination? Yes-religious	0.00	0.00	**0.48**	-0.04	-0.03	-0.03
AS01Items						
26c:Pregnancy	**0.18**	0.13	-0.09	-0.04	0.31	-0.02
25:Serious trouble since training	**0.17**	**0.32**	0.18	-0.05	0.06	0.00
16c:Physical Fitness vs others	-0.09	-0.01	-0.18	**-0.28**	-0.13	0.03
26a:Fail to meet physical requirements	0.08	0.01	**0.26**	**0.29**	0.01	-0.01
21d:Humanitarian or disaster relief	0.08	0.07	**0.46**	0.02	-0.05	0.11
13c:Satisfied-Officer relationships	-0.07	-0.08	0.06	**-0.27**	-0.04	0.09
26i:Meeting weight standards	0.02	-0.03	0.06	**0.26**	-0.09	-0.03
AS01 Composites						
Component: Deviance	**0.21**	**0.34**	**0.26**	0.06	0.10	0.00
Efficacy for Performance	-0.11	-0.07	-0.12	**-0.25**	-0.14	0.06
Physical Fitness	-0.10	-0.01	-0.22	**-0.29**	-0.12	0.03
AS02 Items						
45:Years of Active Duty Expected to Complete is Less than Enlistment Term (1=Yes, 0 = Other)	**0.59**	**0.49**	**0.47**	**0.90**	**0.69**	**0.25**
28:Serious trouble since training	**0.34**	**0.61**	**0.34**	0.01	0.01	0.01
27e:Serious (UCMJ) offenses	**0.32**	**0.57**	**0.30**	0.04	-0.02	0.02
39:Important Complete enlistment obligation	-0.32	-0.18	-0.24	**-0.48**	-0.44	-0.17
27f:Minor offenses	**0.27**	**0.45**	**0.19**	0.08	0.04	0.09
16:Type Army wants as Soldier	-0.27	-0.24	-0.27	**-0.41**	-0.22	-0.08
15b:Personal Discipline vs. others	-0.24	-0.28	-0.25	**-0.24**	-0.13	-0.07
37:Unit leadership supportive of re-enlisting	-0.23	-0.22	-0.24	**-0.30**	-0.13	-0.11
14:Personal values match Army	-0.23	-0.24	-0.14	**-0.30**	-0.16	-0.10
45:Years active service expected	-0.21	-0.16	-0.15	**-0.32**	-0.33	0.00
35:Disappointed if I dropped out of Army	-0.20	-0.09	-0.14	**-0.29**	-0.30	-0.10

Table 7.31. (Continued)

Predictor	Type of Attrition					
	Overall	Moral	Perform	Med/ Phys	Preg/ Parent	Other
27l:Drug/alcohol abuse	0.20	0.37	0.08	0.09	-0.05	0.04
13a:Loyalty to U.S. Army	-0.19	-0.18	-0.15	-0.28	-0.19	0.04
27m:Mental health problems	0.18	0.16	0.07	0.25	0.15	0.22
07e:Earn promotions in the Army	-0.18	-0.17	-0.05	-0.33	-0.09	-0.07
15d:Overall Effectiveness vs. others	-0.18	-0.14	-0.14	-0.30	-0.14	-0.05
44:Active duty Army career intentions	-0.18	-0.13	-0.17	-0.26	-0.29	0.00
13b:Loyalty to unit or organization	-0.18	-0.15	-0.17	-0.28	-0.17	0.00
17f:Performance evaluated fairly	-0.18	-0.15	-0.02	-0.28	-0.19	-0.09
09j:Strong sense of belonging	-0.17	-0.13	-0.13	-0.28	-0.22	0.00
06:Commitment to Army career	-0.17	-0.14	-0.21	-0.30	-0.18	0.01
09cr:Discourage from joining Army (reversed)	-0.17	-0.14	-0.01	-0.30	-0.15	-0.07
43:Army support for family	-0.16	-0.13	0.01	-0.11	-0.28	-0.06
09n:Part of Army family	-0.16	-0.13	-0.05	-0.26	-0.19	-0.04
12b:Satisfied-NCO relationship	-0.16	-0.15	0.00	-0.30	-0.06	-0.10
09g:Proud to tell I am in the Army	-0.16	-0.12	-0.06	-0.26	-0.19	-0.02
27b:Fail to meet physical requirements	0.15	0.02	0.23	0.56	0.01	0.09
07c:Meet Army physical requirements	-0.15	-0.09	-0.06	-0.35	-0.13	-0.02
23:Current level of morale	-0.15	-0.13	-0.08	-0.26	-0.09	-0.08
15c:Physical Fitness vs. others	-0.15	-0.03	-0.19	-0.43	-0.11	-0.03
12n:Satisfied-Life as enlisted Soldier	-0.14	-0.09	0.00	-0.29	-0.19	-0.05
05:Health now vs. when you entered Army	-0.14	-0.07	-0.06	-0.29	-0.09	-0.04
13p:Physical fitness & stamina	-0.12	-0.09	-0.06	-0.28	-0.16	0.04
27d:Pregnancy	0.12	-0.05	0.01	0.01	0.37	0.02
07d:Skills to perform well in future	-0.12	-0.06	0.06	-0.32	-0.13	0.00
27k:Meeting weight standards	0.11	-0.01	0.09	0.46	0.03	0.04
02b:Instilled Army values	-0.10	-0.08	-0.03	-0.25	-0.11	0.04
02a:Army contributed professional development	-0.10	-0.04	-0.07	-0.27	-0.10	0.01
24:Planning to go to college	-0.09	-0.10	-0.25	-0.16	-0.18	0.09
AS02 Composites						
Deviance	0.42	0.68	0.40	0.15	0.08	0.07
Possible Reasons for Leaving Army - Deviance	0.33	0.57	0.24	0.09	0.00	0.07
Perceived Fit with Army	-0.29	-0.28	-0.23	-0.42	-0.22	-0.10
Self-rated Performance	-0.22	-0.21	-0.21	-0.29	-0.13	-0.08
Continuance Intentions	-0.21	-0.16	-0.17	-0.32	-0.33	0.00
Affective Commitment	-0.21	-0.17	-0.09	-0.33	-0.24	-0.01
Component: Positive Army Affect	-0.20	-0.16	-0.08	-0.35	0.08	-0.06
Importance of Core Army Values - Loyalty and Selfless Service	-0.20	-0.18	-0.12	-0.27	-0.22	0.00
Satisfaction with Supervision - Leader Support	-0.19	-0.16	-0.01	-0.26	-0.18	-0.09
Performance Self Efficacy (*sans* 7a, 7c, 7f)	-0.18	-0.14	-0.02	-0.33	-0.14	-0.05
Efficacy for Performance	-0.17	-0.13	-0.03	-0.34	-0.17	-0.03
Satisfaction with Army Life	-0.16	-0.12	-0.01	-0.29	-0.22	-0.06
Satisfaction with Coworkers	-0.14	-0.15	0.01	-0.25	-0.04	-0.04
Satisfaction with Army Training and Experiences	-0.13	-0.07	-0.07	-0.29	-0.15	0.01

Note. Values in cells are adjusted correlations (Kemery et al., 1988) and assume an attrition base rate of .50. Within each category, predictors are sorted in descending order by value of their correlation with Overall attrition (q.v., Table 3.4). Correlations are highlighted if their unadjusted value is at least .05 in magnitude. Correlations for Pregnancy/Parenthood are based on females only.

Modeling Post-AS01 Attrition[58]

Because the top correlates of attrition may not readily lend themselves to influence via Army interventions, it is useful to understand which factors contribute to Soldiers' standing on these correlates and how they jointly influence attrition. To achieve this end, we explored various structural models of unit attrition with the goal of highlighting areas where interventions by the Army may help manage attrition, and why such interventions might work.

Our preliminary model for post-AS01 Overall attrition appears in Figure 7.5. As directed by theory, the most immediate precursor of attrition is the process of thinking about attriting (i.e., Attrition Cognitions, here defined as a combination of lack of confidence for completing one's obligation and not expecting to complete one's obligation). Attrition cognitions, in turn, are modeled as a function of the importance of term completion, stress/strain, and the degree to which Soldiers believe themselves capable of fulfilling their duties as a Soldier (Efficacy for Performance). Deviance also appears as a proximal precursor to attrition, with uncertain (and potentially reciprocal) effects on Attrition Cognitions. Finally, Positive Army Affect (i.e., good feelings about the Army) is viewed as having a direct effect on how highly Soldiers regard term completion.

As with the modeling efforts discussed earlier in this chapter, the preliminary model was fitted and examined for specification errors. Alternative models were estimated until a reasonably parsimonious model with strong fit was obtained. The final model for post-AS01 Overall attrition is presented statistically in Table 7.32. Despite a significant chi-square owing to the statistical power afforded by the large sample (n = 11,632; χ^2=2022.5, df= 121, p < .001), other fit indices indicated the model provided good fit to the data (RMSEA = .04; CFI = .97; reasonably high R^2 values). For ease of presentation, a simplified version of the model appears as an annotated path diagram in Figure 7.6. The relations provided in this figure are those we believe are most amenable to Army manipulation through interventions and countermeasures.

Our modeling efforts suggest that Attrition Cognitions and Deviance were the primary determinants of post-AS01 unit attrition. If the Army desires to reduce unit attrition, our model suggests the Army would be best served by trying to do it through these paths. In general, the finding that these two factors are dominant is not surprising. Indeed, taken alone, this information is not all that useful for suggesting specific recommendations for how the Army can influence attrition. The finding simply begs the question, "What influences Soldiers' attrition cognitions and deviance?" In the sections that follow, we discuss (a) specific factors that underlie these variables and (b) actions the Army might take to influence them.

Deviance

Project First Term gathered extensive survey information about factors that we now know are predictive of deviance. Unfortunately, the breadth of the data collection resulted in little detailed information being gathered about those factors (e.g., detailed criminal history, specific types of pre-service law violations, circumstances and amount of drug use prior to entry, measures of hostility to authority). Thus, based on Project First Term data alone, it is difficult to

[58] Because the base rate of post-AS02 unit attrition was low and most Soldiers were nearing the end of their initial enlistments, we do not present a model of post-AS02 attrition.

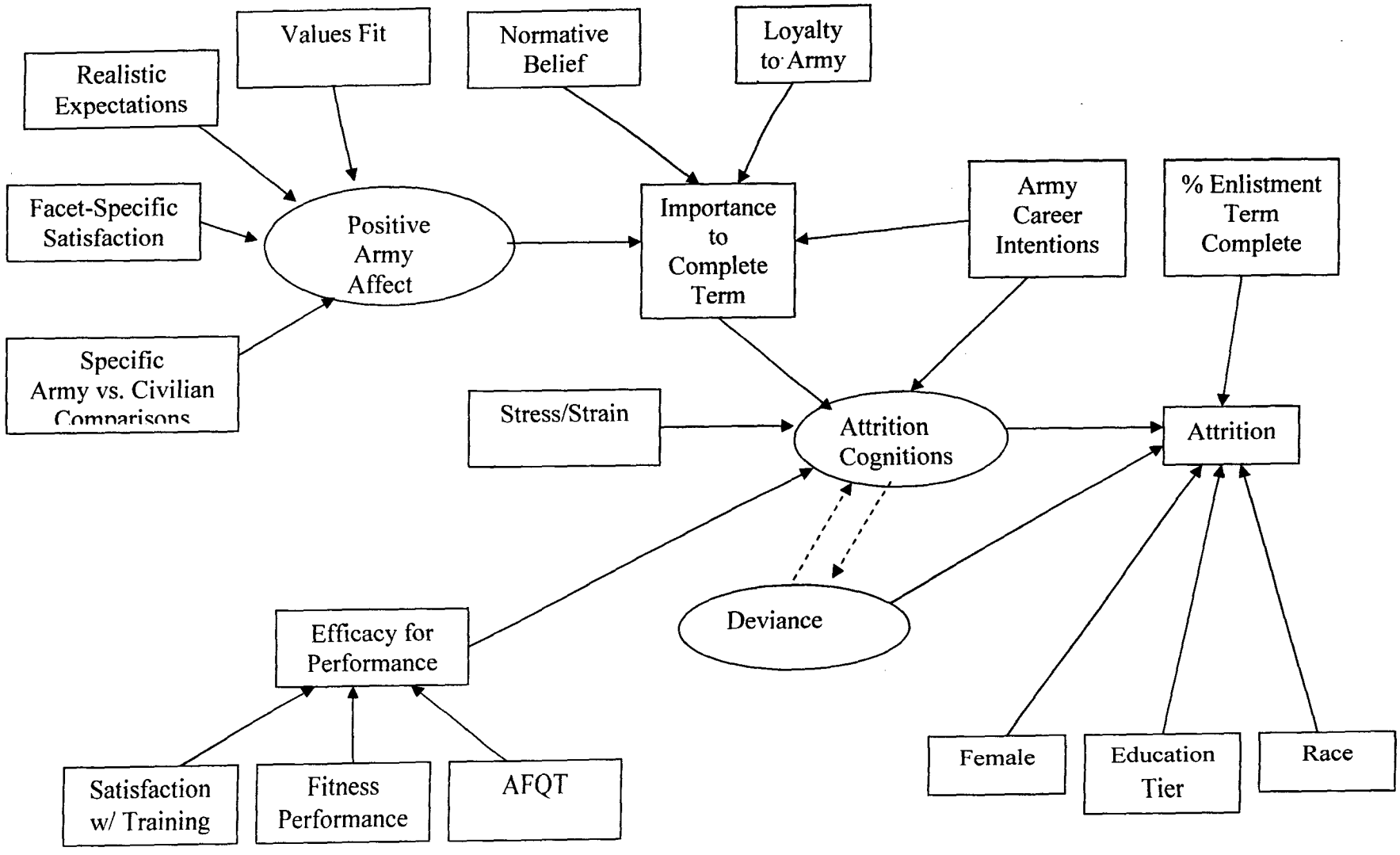
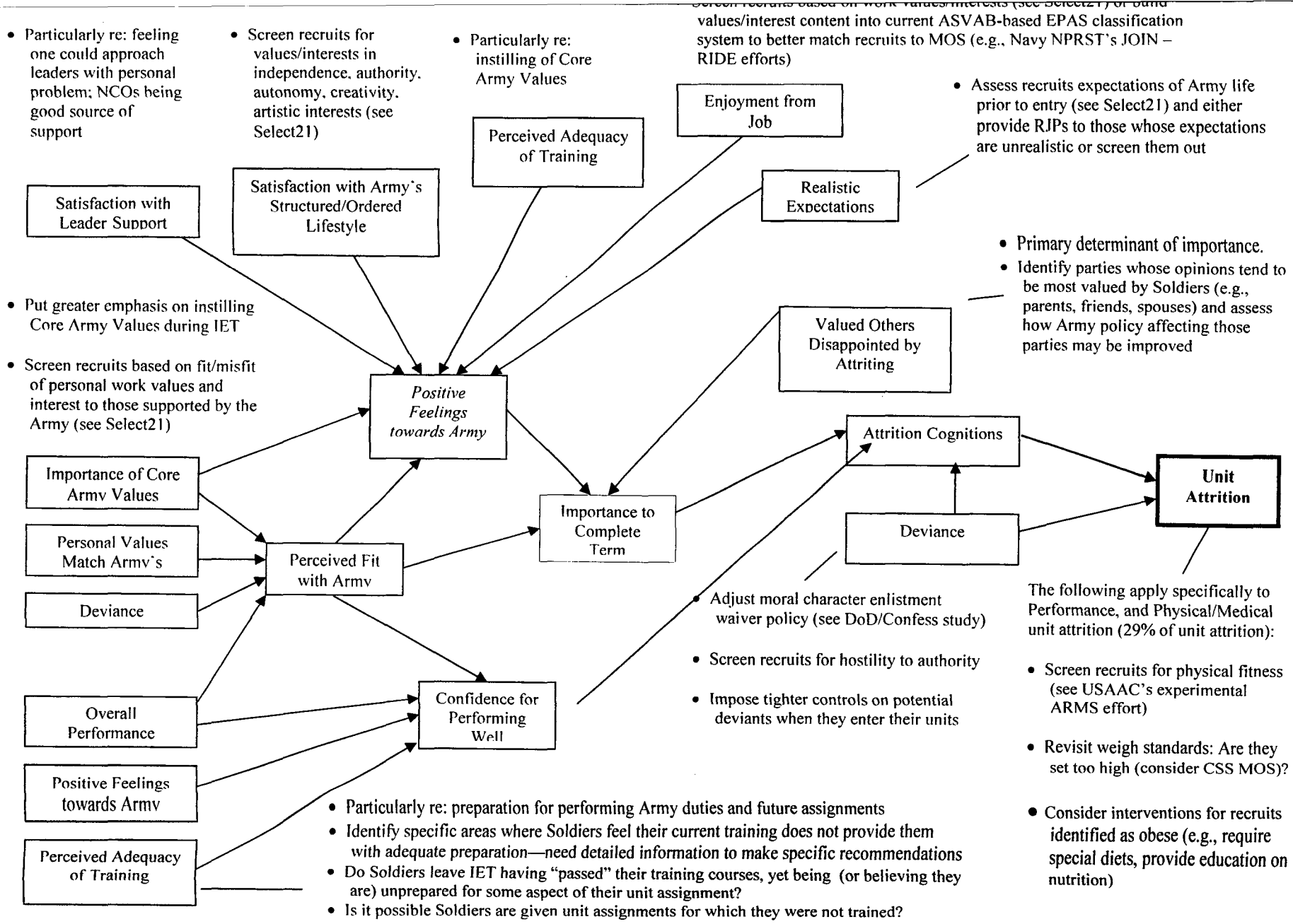


Figure 7.5. Preliminary Structural Model of Post AS01 Unit Attrition



Note. Variables in boxes are part of the final model post-AS01 attrition. In some cases, we have listed the same variable twice in different areas of the figure (the italicized variables) to simplify depiction of the model and prevent paths from overlapping. The bulleted text provides explanations of interventions the Army might use to influence attrition via the paths shown.

Figure 7.6. Simplified Final Model of Post AS01 Unit Attrition

Table 7.32. Structural Coefficients for the Final Model of Post-AS01 Unit Attrition

	Estimate	S.E.	Wald
OVERALL UNIT ATTRITION (R^2 = .24)			
Deviance	0.292	0.015	19.7
Attrition Cognitions	0.271	0.015	18.7
Female	0.420	0.041	10.2
% Enl. Term Completed at AS01	-0.013	0.002	-7.8
Stress/Strain	0.072	0.014	5.2
Important to complete obligation	-0.051	0.015	-3.5
Education Tier 2	0.155	0.057	2.7
ATTRITION COGNITIONS (R^2 = .35)			
Important to complete obligation	-0.278	0.005	-54.9
Efficacy for Performance	-0.309	0.007	-45.2
Deviance	0.120	0.005	23.8
Female	0.209	0.016	12.9
Army Develops Civilian Job KSAs	0.076	0.008	9.5
AFQT (%ile)	-0.003	0.000	-7.0
Difficult to find good civilian job	-0.030	0.006	-4.9
IMPORTANT TO COMPLETE OBLIGATION (R^2 = .46)			
Others disappointed if I dropped out	0.346	0.006	59.1
Type Army wants as a Soldier	0.116	0.008	14.7
Positive Army Affect	0.145	0.011	13.3
Army develops personal character	0.099	0.009	11.5
Loyalty/Selfless Service	0.086	0.008	10.9
Duty	0.102	0.010	10.6
Deviance	-0.065	0.007	-9.0
Stress/Strain	-0.033	0.007	-5.0
EFFICACY FOR PERFORMANCE (R^2 = .53)			
Positive Army Affect	0.255	0.008	31.4
Satisfaction with Training	0.249	0.008	31.1
Type Army wants as a Soldier	0.141	0.007	21.5
Duty	0.123	0.006	19.8
Overall effectiveness vs. others	0.114	0.007	16.9
Stress/Strain	-0.058	0.005	-11.3
AFQT (%ile)	0.003	0.000	10.1
TYPE ARMY WANTS AS A SOLDIER (R^2 = .44)			
Overall effectiveness vs. others	0.347	0.007	46.5
Personal values match Army values	0.169	0.007	22.8
Deviance	-0.117	0.007	-16.6
Loyalty/Selfless Service	0.095	0.006	14.9
Army develops personal character	0.094	0.007	12.8
Work I enjoy is most available	0.096	0.008	12.7
Duty	0.056	0.009	6.5

Table 7.32 (Continued)

	Estimate	S.E.	Wald
POSITIVE ARMY AFFECT (R^2 = .79)			
Loyalty/Selfless Service	0.132	0.004	37.1
Amount of enjoyment from job	0.110	0.004	27.5
Satisfied--Structured Lifestyle	0.120	0.005	25.9
Type Army wants as a Soldier	0.099	0.004	22.0
Satisfaction with Supervision -- Leader Support	0.156	0.007	21.6
Army life vs. expectations	0.097	0.005	20.4
Satisfaction with Training	0.118	0.006	19.8
Overall quality of life	0.082	0.004	18.5
Satisfied--Time for personal goals	0.064	0.004	15.2
Stress/Strain	-0.051	0.004	-14.3
Satisfaction with Supervision -- Leader Expectations	0.108	0.008	13.6
Maintain standard of living	0.055	0.004	13.1
Satisfied--personal and family life	0.048	0.004	12.4
Satisfied--Being away from family	0.041	0.004	9.6

Notes. Variables that appear in all caps were modeled as outcome variables. All variables are from the AS01 survey except Female, Education Tier 2, and AFQT percentile. Estimate = path coefficient. S.E. = standard error. Wald statistic = Estimate/S.E. For each outcome, predictors are sorted in descending order by the absolute value of their Wald statistics. Paths with Wald statistics that exceed 1.65 are statistically significant ($p < .05$, one-tailed).

provide the Army with specific suggestions. What we can say is that, based on these data, the Army should revisit its moral character enlistment waiver policy. Specifically, the Army should examine how such policy may be modified to better identify and screen recruits who may later engage in deviant behavior and attrit for reasons linked to moral character.

Fortunately, the Army would not have to go into this task blindly. A recent study for the Office of Accession Policy within the Office of the Undersecretary of Defense provides a detailed evaluation of the Army's (as well as the other Services) moral character waiver policy (Putka, Noble, Becker, & Ramsberger, 2004). This study makes specific recommendations (detailed to the level of different types of moral character enlistment waivers, and different types of pre-service transgressions) as to how policy can be adjusted for the purpose of reducing in-service deviant behavior and moral character attrition. Furthermore, this research provides specific recommendations for studies that could help the Army further refine its moral character waiver policy (e.g., evaluate quality of criteria used by personnel who make waiver approval/denial decisions).

It is also worth noting that moral character attrition was not prevalent during IET as it was in the unit, and thus incidents of pre-service deviance (as captured by the SRS) were not all that predictive of IET attrition. This finding is consistent with Soldiers' behavior being more constrained in IET than in unit (where moral character becomes much more of an issue), suggesting that the Army might affect unit attrition by placing tighter controls on Soldiers identified as potential deviants (e.g., based on enlistment data) once they reach their units.

Attrition Cognitions

Unlike probable factors leading to in-service deviance, the Project First Term database provided detailed data on variables relevant to predicting attrition cognitions. We found that the best predictors of attrition cognitions were the importance of completing one's enlistment and one's confidence in the ability to perform well in the Army. To help the Army influence attrition cognitions (and thereby influence attrition), we examined those factors that predicted importance and confidence.

Importance of Completing Term. The best predictor of how important Soldiers felt it was to complete their term was whether Soldiers believed that the people they value most would be disappointed if they attrited. This speaks to the importance of the attitudes and opinions of persons deemed important by the individual Soldier. For the Army to influence attrition through this path, it must first identify what groups of people Soldiers generally tend to deem most important (e.g., spouses, parents, friends, fellow Soldiers, superiors). Once these groups are identified, the Army could examine how various policies might be positively/negatively influencing their views. Efforts then could be made to modify policies in a manner that enhances (or at least does not diminish) these groups' views of the Army.

Perceived Fit with the Army. Also predictive of Soldiers' importance to complete their term was a Soldier's belief that he/she is the type of individual the Army wants. Soldiers who believed they were a good fit to the Army rated themselves highly on overall effectiveness, reported that their personal values match those of the Army, believed the Core Army Values of loyalty and selfless service were important, and were low on deviance. The findings with regard to values are particularly interesting in that they suggest the Army might influence attrition by putting more emphasis on instilling the Core Army Values in Soldiers during training. Another potential strategy would be to (a) identify recruits who either value things the Army does not support or fail to value the things the Army does support, and (b) give them a clearer idea of what the Army is like prior to entry. In line with this latter strategy, efforts are currently under way as part of ARI's Select21 project (see Knapp, 2003) to develop pre-entry assessments of the match between recruits' work values and interests, and those supported by the Army.

Positive Army Affect. Also predictive of Soldiers' assessment of the importance of completing their term were Soldiers' feelings towards the Army. In the model, the "Positive Feelings towards the Army" variable reflects a combination of feeling emotionally attached to the Army, being satisfied with Army life in general, having high morale, and taking pride in the Army. Several factors were predictive of positive feelings towards the Army. There again is an element of fit with the Army (i.e., satisfaction with a structured/ordered lifestyle) and of adopting core Army values (loyalty/selfless service). Hence, interventions discussed for Perceived Fit with the Army might have positive benefits for Army Affect as well.

Efficacy for Performance. In addition to importance of completing one's term, the other primary predictor of Soldiers' attrition cognitions was the confidence they had for performing well in the Army. The best predictors of confidence were (a) perceived adequacy of training (particularly regarding preparation for performing Army duties and handling future assignments), (b) positive feelings towards the Army, (c) overall performance, and (d) perceived

fit with the Army. With the exception of overall performance, ideas for how the Army could influence these factors are noted in Figure 7.6.

Individual Growth Curve Analyses (Models of Intraindividual Change)

The longitudinal nature of the Project First Term investigation permitted us to analyze Soldiers' survey data through hierarchical linear modeling (HLM), a procedure that is appropriate with nested data. In a longitudinal project where subjects have repeated measures, one can view the data as nested, with measurement occasions nested within individuals. For this effort, we used HLM to build models of intraindividual change that allow us to determine whether Soldiers differ with regard to their (a) initial status on certain attitudinal variables thought to be precursors of attrition (e.g., affective commitment, self efficacy, loyalty to the Army) and (b) change in standing on these variables over time.

We can plot each Soldier's scores on a given variable over time based on how he or she responded to the scale across surveys from Project First Term (SRS, EOTA, AS01, AS02).[59] Plotting the scores across time will yield a "growth trajectory"—a curve (or line) that shows the Soldier's status on a particular variable through time. Initial status is indexed by the curve's intercept and growth over time by its slope. HLM allows us to determine whether there is meaningful variation in the intercepts and slopes of Soldiers' growth curves and, if so, whether that variation can be accounted for by characteristics of the Soldiers (e.g., reasons the Soldier joined the Army).

Although we could have examined changes in numerous variables across time, we focused our HLM efforts on variables assessing attitudes towards and perceptions of the Army—variables that our previous findings suggest are important to understanding attrition. We evaluated models of intraindividual change for the 12 variables shown in Table 7.33. As shown in the table, we were able to retain samples of respectable size while examining scores across at least three surveys for each of the variables.

Table 7.33. Criterion Variables Used in the Analysis of Intraindividual Change and the Surveys from Which Scores Were Obtained

Variable	*n*	Surveys Used
Affective Commitment Commitment to Army Career Continuance Intentions Duty Morale Stress/Strain	1,393	SRS, EOTA, AS01, AS02
Loyalty to the Army Perceived Fit with the Army Proud to Be in Army Satisfaction with Army life	1,994	EOTA, AS01, AS02
Efficacy for Adapting to the Army Efficacy for Completing the Enlistment Term	3,890	SRS, EOTA, AS01

Note. SRS = Soldier Reception Survey; EOTA = End-of-Training (AIT/OSUT) Survey; AS01 = 2001 Annual Survey; AS02 = 2002 Annual Survey.

[59] Although we could also have used EOTB responses, we chose the EOTA survey for analysis because the attitudes and perceptions occur closer in time to in-unit attrition.

Results

Descriptive Statistics. Descriptive statistics for the 12 criterion variables are given in Table 7.34. The table shows that scores on all criteria deteriorate after Soldiers enter their units. As a group, relative to their reported scores at the end of IET, they reported lower levels of commitment, satisfaction, core Army values, and efficacy while reporting higher levels of stress and strain.

Table 7.34. Descriptive Statistics for the 12 Criterion Variables from the Intraindividual Change Analyses

	Mean				Standard Deviation				*n*			
Criterion Variable	SRS	EOTA	AS01	AS02	SRS	EOTA	AS01	AS02	SRS	EOTA	AS01	AS02
Affective Commitment	3.55	3.52	2.80	2.88	0.86	0.78	0.96	0.98	1,392	1,377	1,386	1,385
Commitment to Army Career	3.61	3.48	2.64	2.72	1.00	1.05	1.20	1.28	1,387	1,377	1,377	1,381
Continuance Intentions	3.81	3.67	2.89	3.06	1.62	1.62	1.26	1.36	1,393	1,377	1,385	1,392
Duty	6.14	6.30	5.80	5.79	0.92	0.77	1.07	1.13	1,390	1,372	1,386	1,387
Morale	3.57	3.68	2.91	2.78	0.89	1.00	1.08	1.08	1,391	1,369	1,379	1,381
Stress/Strain	3.53	3.73	4.23	4.02	1.40	1.41	1.25	1.34	1,391	1,370	1,383	1,372
Loyalty to the Army		5.92	5.16	3.41		1.15	1.49	0.62		1,964	1,984	1,982
Perceived Fit with the Army		4.04	3.68	3.73		0.64	0.80	0.86		1,968	1,977	1,958
Proud to Be in Army		4.34	3.62	3.67		0.83	1.04	1.04		1,966	1,983	1,981
Satisfaction with Army life		3.39	2.79	2.80		0.69	0.79	0.81		1,971	1,989	1,994
Efficacy for Adapting to the Army	4.10		3.22	3.89	0.96		1.22	1.01	3,886		3,857	3,829
Efficacy for Completing the Enlistment Term	4.44		4.16	4.33	0.85		1.08	0.88	3,885		3,855	3,826

Models of Intraindividual Change. Intraindividual growth models have a multilevel structure. Formally,

$$Y_{ti} = a_i + b_i X_{ti} + \varepsilon_{ti}$$

where Y_{ti} represents the score on criterion variable Y at time t for Soldier i, a_i and b_i are the intercept and slope parameters of the growth trajectory for Soldier i, X_{ti} is a variable indicating the time of survey administration (TIME, which was coded thus: SRS=0, EOTA=1, AS01=2, and AS02=3), and ε_{ti} is a random error term—specifically, a random effect. The i-subscript for the

intercept and slope parameters indicates that each Soldier has a personal growth trajectory. This model for the criterion variables is termed the *level-one equation.*

The HLM models of intraindividual change evaluate the degree to which these intercept and slope parameters vary across individuals. In addition, we can use person-level variables to try to explain any observed variation in the growth parameters. For example, we can try to predict which Soldiers start off being most or least committed to the Army, and which Soldiers tend to experience the most degradation in their commitment over time as a function of individual difference variables. Formally, we may construct the following equations for the parameters from the level-one equation:

$$a_i = a + \pi_a M_i + \eta_a$$
$$b_i = b + \pi_b M_i + \eta_b$$

where a_i and b_i are as before; a and b are the mean values of the intercept and slope parameters across individuals; π_a and π_b are regression coefficients applied to M_i, a vector of variables assessing Soldier characteristics (e.g., gender, education tier); and η_a and η_b are random error terms (i.e., the random effects). To the extent that the M_i variables predict variability in the individual growth parameters a and b, the amount of uncertainty in the regression system is reduced (specifically, the random effects are smaller) and we may assert that Soldiers with certain individual characteristics tend to have higher/lower initial standing on our criteria or tend to increase/decrease in their standing on the criteria during their first enlistment term. These equations are termed the *level-two equations.*

Through substitution of the level-two equations into the level-one equation, we obtain the following:

$$Y_{ti} = a_i + b_i X_{ti} + \varepsilon_{ti}$$
$$Y_{ti} = (a + \pi_a M_i + \eta_a) + (b + \pi_b M_i + \eta_b) X_{ti} + \varepsilon_{ti}$$
$$Y_{ti} = a + bX_{ti} + \pi_a M_i + \pi_b M_i X_{ti} + \eta_a + \eta_b X_{ti} + \varepsilon_{ti}$$

This latter specification shows the multilevel model in the form required to fit such models in SAS Proc Mixed. We again see the mean intercept term a, but it is augmented by a second term $\pi_a M_i$, which is a function of the predictors in the level-two equation (here, variables that assess Soldier characteristics such as their reasons for joining the Army[60]). Similarly, we again see the mean slope applied to the variable indexing time—bX_{ti}—but it, too, is augmented by a level-two term ($\pi_b M_i X_{ti}$) that may be viewed as an interaction between the level-two predictors and the level-one variable(s) (here, the single level-one variable TIME). Finally, the last three terms in the equation constitute the complex random effects error term.

[60] Only administrative variables (e.g., gender) and those variables from the SRS survey were considered as level-two predictors, given that the SRS provided the initial point in the growth trajectories. Use of subsequent surveys would have yielded nonsensical postdictive relations, with predictors collected at later points in time than the criteria they were predicting.

The modeling process that we followed for estimating the individual growth models generally involved the estimation of three models per criterion variable: (a) a baseline model, which contained only the level-one predictor TIME (i.e., the survey under consideration); (b) one or more full models, which contained both the level-one (TIME) and level-two (individual characteristics) variables; and (c) a final model, which included only those level-two variables that attained statistical significance in the full model. For each criterion variable, we selected the level-two predictors to include in the models on the basis of their zero-order correlations with the intercept and slope parameters from the individual growth trajectories. For most criteria, we estimated two "full" models—one including level-two variables that had the highest correlations with initial status (i.e., with the intercept parameters) and one including level-two variables that had the highest correlations with change over time (i.e., with the slope parameters). Table 7.35 lists the level-two variables selected for each criterion variable.

For three criteria, the modeling process deviated a bit from the one just described. Specifically, the criterion variables Loyalty to the Army, Proud to Be in the Army, and Satisfaction with Army Life evidenced no statistically reliable variation in slope coefficients across Soldiers–indicating that the change in these variables across time was relatively similar across Soldiers. We therefore estimated the following models for these variables: (a) a baseline model allowing variation in both slopes and intercepts, (b) a second baseline model allowing variation in intercepts only, (c) a full model containing the most promising level-two predictors (i.e., those that correlated most strongly with initial status), and (d) a final model containing the level-two variables that achieved statistical significance in the full model.

Results from the final model for each criterion variable are provided in Tables 7.36 through 7.47. These tables include (a) sample sizes, (b) parameter estimates, (c) associated *t* values, and (d) covariance parameter estimates. To aid interpretation of the values in these tables, we first discuss each of the values in Table 7.36 and then present general observations based on all the tables.

Table 7.36 presents the parameters from the final model for Affective Commitment. For this and all models, continuous variables were centered at their grand mean (i.e., they are deviation scores) to facilitate interpretation of the model parameters. Hence, the first term, Intercept, gives the mean Affective Commitment score (3.598) for Soldiers contributing data to this analysis. The next parameter is the slope coefficient for the TIME variable. Because this coefficient is negative and was set to 0 for the SRS administration, it indicates that the mean Affective Commitment score decreased by 0.271 points with each subsequent survey administration. The next five parameters have positive values and are affiliated with Soldier characteristics used as level-two predictors. Four variables regard reasons Soldiers might have joined the Army, the other indexes how familiar Soldiers thought they were with what the Army would expect of them. Taking the first variable, "Desire to serve my country," the coefficient of 0.164 indicates that Soldiers who scored one point above the mean on this variable could be expected to have an initial status on Affective Commitment (i.e., their SRS Affective Commitment score) of 3.598 + 0.164 = 3.762, holding the other variables constant. The other four coefficients may be interpreted similarly. Hence, if these reasons were of above-average importance to the Soldier, they would be expected to have a higher initial standing on Affective Commitment (again, all other things being equal). These five coefficients are the π_a terms from the combined multilevel equation.

Table 7.35. SRS and Administrative Variables Selected as Level-Two Predictors

	Affective Commitment	Commitment to Army Career	Continuance Intentions	Duty	Morale	Strain/ Stress	Loyalty to the Army	Perceived Fit with the Army	Proud to Be in Army	Satisfaction with Army life	Efficacy for Adapting to the Army	Efficacy for Completing the Enlistment Term
Intercepts	01u	01u	01u	01q	04	AFQT	01c	01c	01c	01c	01u	01u
	01c	01c	01c	01c	01u	srs43	01u	01u	01aa	01u	04	01aa
	01aa	01d	04	01d	01c	xhqr	01aa	04	01u	04	01aa	04
	01d	01v	01p	01aa	01q	srs37	01t	srs35	01v	01a	01d	01d
		01r	enlt	01u	01aa	srs36	moscss	01aa	04	01aa	01c	01r
		01aa	01l	01x	01d	srs42	rblack		01h	enlt	01r	01q
			01g	01p	01x	01z	04		moscss	AFQT	01t	01p
			01r	01t	01p	01aa					01q	01c
			01v	01v	01r	rother					01p	01x
			01aa	01r	01v	age					01v	01t
			01d	01f	AFQT	rblack					csrs35	01v
				01l		01c					01x	01n
						01u					01n	01f
						04						
Slopes	01u	04	01p	01d	01o	04	NA	01j	NA	NA	01d	01v
	01aa	xhqr	01t	01t	01p	01u		01u			01t	enlt
	01r	01c	01r	01l	cpayg	rblack		01o			01r	01l
	04	enlt	enlt	01v	01n	01q		01e			01x	01t
	01c	01n	04	01e	01d	01x		01aa			01n	01n
	01q	01r	01c	01o	01v	srs43		01r			01q	01x
	01x	01aa	01aa	01r	female	AFQT					01p	01r
	01d		01u	01p	01r	01aa					01aa	01d
	01t			01q	01x	srs36					04	04
				01aa	01q	srs37					01u	01p
				01x	01aa							01q
					01u							01aa
					04							01u

Note: xhqr = high quality recruit; moscss = MOS: Combat Service Support; rother = race: other; AFQT = category; rblack = race: black; enlt = enlistment term; cpayg = pay grade at entry.

Table 7.36. Growth Curve Results—Affective Commitment

Effect	Estimate	*t* Value	*p*
Intercept	3.598	208.5	<.0001
TIME	-0.271	-27.2	<.0001
Desire to serve my country	0.164	11.9	<.0001
Develop self-discipline	0.041	2.9	.0035
Make Army a career	0.159	11.7	<.0001
Chance for adventure	0.082	5.4	<.0001
Familiar with what Army will expect of me	0.125	7.0	<.0001
TIME*Make Army a career	-0.050	-6.6	<.0001
TIME*Chance for adventure	-0.056	-6.5	<.0001
TIME*Familiar with what Army will expect of me	-0.039	-3.8	.0002

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.070	3.9	<.0001
UN(2,1)	0.016	1.9	.0531
UN(2,2)	0.040	6.8	<.0001
Corr(2,1)	0.302		

Note. n = 1,362. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.37. Growth Curve Results—Commitment to Army Career

Effect	Estimate	*t* Value	*p*
Intercept	3.634	157.7	<.0001
TIME	-0.280	-14.8	<.0001
Make Army a career	0.096	6.5	<.0001
Desire to serve my country	0.094	4.5	<.0001
Develop self-discipline	0.075	4.2	<.0001
Chance to travel	0.061	3.7	.0002
TIME*High-quality recruit	-0.118	-5.2	<.0001
TIME*Desire to serve my country	-0.032	-2.8	.0053
TIME*Enlistment Term	-0.032	-2.3	.0237
TIME*Need to be on my own	-0.017	-2.2	.0251
TIME*Chance for adventure	-0.040	-4.1	<.0001

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.049	1.5	.0684
UN(2,1)	0.035	2.3	.0247
UN(2,2)	0.048	4.5	<.0001
Corr(2,1)	0.711		

Note. n = 1,355. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.38. Growth Curve Results—Continuance Intentions

Effect	Estimate	*t* Value	*p*
Intercept	3.828	119.3	<.0001
TIME	-0.307	-19.9	<.0001
Make Army a career	0.743	29.6	<.0001
Familiar with what Army will expect of me	0.100	4.0	<.0001
Enlistment Term	0.291	7.2	<.0001
Medical care, coverage, and benefits	0.054	2.7	.0067
Become more mature	-0.078	-3.1	.0020
TIME*Enlistment Term	-0.084	-4.3	<.0001
TIME*Chance for adventure	-0.040	-3.9	<.0001
TIME*Make Army a career	-0.218	-18.3	<.0001
TIME*Become more mature	0.046	3.8	0.0002

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.597	10.4	<.0001
UN(2,1)	-0.102	-4.3	<.0001
UN(2,2)	0.095	6.9	<.0001
Corr(2,1)	-0.429		

Note. n = 1,340. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.39. Growth Curve Results—Duty

Effect	Estimate	*t* Value	*p*
Intercept	6.240	331.0	<.0001
TIME	-0.151	-13.5	<.0001
Training in job skills	0.127	7.6	<.0001
Desire to serve my country	0.139	9.3	<.0001
Develop self-discipline	0.050	3.1	.0017
Chance for adventure	0.120	7.1	<.0001
Make Army a career	0.061	4.7	<.0001
Educational benefits	0.084	5.0	<.0001
Prove that I could do it	0.026	2.0	.0418
TIME*Chance for adventure	-0.041	-3.9	.0001
TIME*Gain job experience	-0.049	-5.9	<.0001
TIME*Chance to travel	-0.037	-4.0	<.0001

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.106	5.0	<.0001
UN(2,1)	0.006	0.6	.5479
UN(2,2)	0.061	8.6	<.0001
Corr(2,1)	0.074		

Note. n = 1,347. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.40. Growth Curve Results—Morale

Effect	Estimate	*t* Value	*p*
Intercept	3.706	178.1	<.0001
TIME	-0.315	-28.2	<.0001
Desire to serve my country	0.091	6.0	<.0001
Make Army a career	0.092	5.7	<.0001
Familiar with what Army will expect of me	0.193	8.9	<.0001
AFQT	-0.005	-5.2	<.0001
TIME*Familiar with what Army will expect of me	-0.072	-6.2	<.0001
TIME*Make Army a career	-0.034	-4.1	<.0001

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.037	1.4	.0869
UN(2,1)	0.048	4.0	<.0001
UN(2,2)	0.011	1.4	.0746
Corr(2,1)	>1.000		

Note. n = 1,372. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.41. Growth Curve Results—Stress/Strain

Effect	Estimate	*t* Value	*p*
Intercept	3.534	79.5	<.0001
TIME	0.219	10.6	<.0001
AFQT	0.007	4.0	<.0001
Drink before DEP	0.268	3.8	.0001
Medical advice against sports/exercise	0.564	4.0	<.0001
Needed a place to live	0.109	4.0	<.0001
Race -- Other	-0.256	-2.2	.0316
Age	-0.034	-4.1	<.0001
Race -- Black	-0.324	-3.6	.0004
Desire to serve my country	-0.076	-3.4	.0006
Make Army a career	-0.084	-3.4	.0008
Familiar with what Army will expect of me	-0.189	-5.6	<.0001
TIME*Familiar with what Army will expect of me	0.080	5.0	<.0001
TIME*Make Army a career	0.034	2.9	.0033
TIME*Race -- Black	0.117	2.8	.0056
TIME*Drink before DEP	-0.090	-2.8	.0058
TIME*AFQT	-0.002	-2.6	.0088
TIME*Medical advice against sports/exercise	-0.262	-3.9	<.0001

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.519	8.7	<.0001
UN(2,1)	-0.069	-2.9	.0044
UN(2,2)	0.058	4.2	<.0001
Corr(2,1)	-0.399		

Note. n = 1,351. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.42. Growth Curve Results—Loyalty to the Army

Effect	Estimate	*t* Value	*p*
Intercept	6.165	207.5	<.0001
TIME	-1.282	-69.3	<.0001
Desire to serve my country	0.239	12.4	<.0001
Make Army a career	0.063	3.9	.0001
Race -- Black	-0.154	-2.7	.0065

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.293	11.8	<.0001
Corr(2,1)	NA		

Note. n = 1,374. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.43. Growth Curve Results—Perceived Fit with the Army

Effect	Estimate	*t* Value	*p*
Intercept	3.970	245.4	<.0001
TIME	-0.159	-12.8	<.0001
Desire to serve my country	0.096	7.4	<.0001
Make Army a career	0.044	3.9	.0001
Familiar with what Army will expect of me	0.078	4.6	<.0001
TIME*Familiar with what Army will expect of me	-0.037	-2.8	.0047
TIME*Fitness level before Army	0.056	4.1	<.0001
TIME*Chance for adventure	-0.031	-3.4	.0008
TIME*Influence of friends	-0.030	-3.1	.0018

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.051	2.9	.0022
UN(2,1)	0.056	5.2	<.0001
UN(2,2)	0.027	2.5	.0063
Corr(2,1)	>1.000		

Note. n = 1,361. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.44. Growth Curve Results—Proud to Be in Army

Effect	Estimate	*t* Value	*p*
Intercept	4.240	173.0	<.0001
TIME	-0.330	-21.3	<.0001
Desire to serve my country	0.133	8.2	<.0001
Familiar with what Army will expect of me	0.047	2.4	.0157
Get away from a personal problem	-0.061	-3.5	.0004

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.274	13.8	<.0001
Corr(2,1)	NA		

Note. n = 1,380. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.45. Growth Curve Results—Satisfaction with Army Life

Effect	Estimate	*t* Value	*p*
Intercept	3.317	171.2	<.0001
TIME	-0.317	-26.9	<.0001
Desire to serve my country	0.065	4.7	<.0001
Make Army a career	0.047	3.9	.0001
Familiar with what Army will expect of me	0.040	2.5	.0135
Enlistment Term	-0.081	-4.0	<.0001
AFQT	-0.004	-4.3	<.0001

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.193	15.2	<.0001
Corr(2,1)	NA		

Note. n = 1,366. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.46. Growth Curve Results—Efficacy for Adapting to the Army

Effect	Estimate	*t* Value	*p*
Intercept	4.186	297.4	<.0001
TIME	-0.438	-38.1	<.0001
Make Army a career	0.152	13.2	<.0001
Familiar with what Army will expect of me	0.187	12.6	<.0001
Chance for adventure	0.112	8.9	<.0001
Develop self-discipline	0.096	6.1	<.0001
Desire to serve my country	0.048	3.6	.0004
Become more mature	-0.032	-2.5	.0122
Fitness level before Army	0.102	7.7	<.0001
TIME*Make Army a career	-0.064	-6.8	<.0001
TIME*Familiar with what Army will expect of me	-0.069	-5.8	<.0001
TIME*Chance for adventure	-0.054	-5.2	<.0001
TIME*Develop self-discipline	-0.041	-3.2	.0013
TIME*Desire to serve my country	0.029	2.7	.0075
TIME*Become more mature	0.026	2.5	.0130
TIME*Need to be on my own	-0.028	-4.0	<.0001

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.134	6.1	<.0001
UN(2,1)	-0.006	-0.4	.6754
UN(2,2)	0.127	9.0	<.0001
Corr(2,1)	-0.046		

Note. n = 3,725. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Table 7.47. Growth Curve Results—Efficacy for Completing the Enlistment Term

Effect	Estimate	*t* Value	*p*
Intercept	4.452	354.5	<.0001
TIME	-0.138	-13.6	<.0001
Make Army a career	0.090	9.0	<.0001
Chance for adventure	0.108	9.8	<.0001
Familiar with what Army will expect of me	0.140	10.6	<.0001
Develop self-discipline	0.057	4.6	<.0001
Desire to serve my country	0.050	5.3	<.0001
Educational benefits	0.066	6.5	<.0001
Enlistment Term	0.069	4.6	<.0001
TIME*Make Army a career	-0.057	-7.1	<.0001
TIME*Familiar with what Army will expect of me	-0.048	-4.6	<.0001
TIME*Develop self-discipline	-0.028	-2.9	.0036
TIME*Training in job skills	-0.025	-3.3	.0010
TIME*Need to be on my own	-0.023	-3.9	.0001
TIME*Enlistment Term	-0.073	-6.0	<.0001
TIME*Chance for adventure	-0.032	-3.6	.0003

Covariance Parameter	Estimate	*Z* Value	*p*
UN(1,1)	0.122	7.0	<.0001
UN(2,1)	-0.008	-0.7	.4852
UN(2,2)	0.100	9.1	<.0001
Corr(2,1)	-0.071		

Note. n =3,756. Estimate = regression coefficient. UN (1,1) = variance of intercept parameters across Soldiers. UN(2,1) = covariance of intercept and slope parameters. UN(2,2) = variance of slope parameters across Soldiers.

Turning to the next three coefficients, we see negative values to be applied to a product term of (a) the TIME variable and (b) a Soldier characteristic. These values indicate that scoring above average on the three characteristics crossed with TIME exacerbates the general downward trend in the Affective Commitment trajectories. Thus, although Soldiers do show a decrease in Affective Commitment on average, this decrease is greater for Soldiers who joined the Army to make the Army a career or to seek adventure. Similarly, Soldiers who thought they were more familiar than average with what the Army expected of them showed greater decreases in Affective Commitment over time.

The next four values present elements from a covariance matrix for the regression parameters. UN(1,1) gives the estimated variance in the intercept parameters across Soldiers, UN(2,1) gives the estimated covariance between intercepts and slopes (i.e., the covariance between initial status and change over time), and UN(2,2) gives the estimated variance in the slope parameters across Soldiers. The values for the two variances are significantly greater than zero (t values greater than 1.96, $p < .05$) and thus signify that although the level-two Soldier characteristics each explained significant amounts of this variation, significant variation in these coefficients remains unexplained. The t value for the covariance, however, is not significant and thus indicates no significant relation between initial status on Affective Commitment and change in commitment over time. Finally, the Corr(2,1) term presents the standardized version of the covariance given as UN(2,1)—the correlation between intercepts and slopes.

Before presenting the general findings for the tables as a whole, please note the following. First, for two models (Morale, Perceived Fit with the Army) the multilevel model was

somewhat ill-conditioned, yielding non-positive estimates of one or more variance parameters. Attempts to remedy this condition failed. Hence, although the parameters for these models are the best available, the variance and covariance estimates lead to correlations between intercepts and slopes that exceed 1.0. Second, there are no covariance or slope-variance terms for three models (Loyalty to the Army, Proud to Be in the Army, Satisfaction with Army Life) because the variance in slopes was estimated to be zero.

Regarding Tables 7.36 – 7.47 collectively, we may draw the following inferences:

- For all criterion variables but Morale and the two assessing commitment, initial status correlated negatively with change over time, indicating that those who scored high on the attitude tended to decrease over time and vice versa.
- For all variables but Stress/Strain, the mean slope over time was negative, indicating worsening attitudes with Army experience. For Stress/Strain, the mean slope was positive, indicating greater levels of stress over time.
- Certain variables appeared as significant predictors of initial status (variance in intercepts) for nearly all models: SRS01c (Reason Joined Army: Desire to serve my country), SRS01u (Reason Joined Army: Make Army a career), and SRS04 (Familiarity with what Army will expect of you), with higher values leading to higher initial status (i.e., a positive relation) for all criteria except Stress/Strain, where higher scores indicated lower initial status (i.e., less stress upon entry).
- Certain variables appeared as significant predictors of change over time (variance in slopes) for many models: SRS01u, SRS04, and SRS01aa (Reason Joined Army: Chance for adventure), with higher values leading to negative growth (i.e., a negative relation) for all values except Stress/Strain, where higher scores indicated positive slopes (greater stress over time).
- Stress/Strain looked quite different from the other criteria examined. In addition to the reverse effects regarding SRS04 and "sub-items" from SRS01, a very different set of level-two variables related to initial status and change over time. For initial status, predictors included AFQT (+), SRS37 (During the 2 years before entering the Army, were you ever advised by a medical practitioner not to participate in any exercise or sport programs?) (+), SRS43 (During the last 6 months before entering the DEP, how often did you drink alcoholic beverages?) (+), Race-Other (-), Race-Black (-), Age (-), and SRS01z (Reason Joined Army: Needed a place to live) (+). Predictors of change over time were Race-Black (+), SRS37 (-), SRS43 (-), AFQT (-), SRS04 (+), and SRS01u (+).
- Analyses for Loyalty, Proud to Be in the Army, and Satisfaction with Army Life all yielded an estimate of zero for variance in slopes. For these three variables, all growth trajectories examined (via random selection) showed strong negative slopes, indicating strong drops in scores that were nearly universal.

DISCUSSION

In this chapter, we set out to better understand unit attrition. Specifically, we identified six questions for which we sought answers. The analytic results presented in the preceding pages answer these questions. We now address each question in turn.

1. Does the frequency or composition of attrition (e.g., moral character *vs.* performance) vary by month in service? If so, how?

Our life table analysis of unit attrition over time addressed these questions. Table 7.2. shows that after an elevated attrition rate in the first 3 months, Overall unit attrition levels out to a relatively constant rate, with the conditional probability of the event lying mostly between .006 and .100 (i.e., 0.6% and 1.0%) in any given month. Our analysis of the composition of attrition over time (Table 7.3) highlighted the heterogeneity of the event, as well as its changing complexion over time. Initially, unit attrition mirrors IET attrition, with attrition in the first few months arising primarily from physical/medical and performance factors. Later, however, unit attrition is attributable primarily to Moral Character reasons.

2. Which variables collected prior to unit service have the strongest bivariate relationships with unit attrition?

To address this question, we calculated correlations between the survey variables (both items and composites) and Overall attrition. Table 7.4 indicates that the majority of variables (a) available prior to unit service and (b) predictive of unit attrition are those that assess deviant behavior (e.g., smoking prior to DEP, getting in trouble in high school, thoughts about quitting high school). Level of stress/strain/conflict experienced in training also showed a moderate correlation with Overall unit attrition. Among the administrative variables, education tier and gender correlated most highly with Overall attrition.

3. Do bivariate relations between pre-unit variables and attrition depend on the type of attrition examined? If so, how?

Table 7.6 clearly displays the differential patterns of correlation the administrative and survey variables have across the six unit attrition criteria. The patterns generally hold according to theory, with medical/physical variables being most predictive of performance and medical/physical attrition, and variables assessing past withdrawal behavior and deviance correlating most strongly with Overall, Moral Character, and Pregnancy/Parenthood attrition.

4. Do bivariate relations between pre-unit variables and attrition vary by the month in service when attrition occurs? If so, how?

The relations between most predictors and the attrition criteria vary across time, which is not unexpected given the information in Tables 7.4 through 7.6. Variables assessing medical/physical condition—especially those variables from the EOTA survey—best predict early unit attrition (i.e., attrition in the first 3 months in unit). Variables that assess delinquency and past withdrawal better predict later unit attrition (from the fourth month onward). The majority of prediction to be realized for unit attrition appears to occur early on. Only a few variables demonstrated noteworthy relations with attrition after the fifth month of in-unit time.

5. How well can we predict the various attrition criteria using multivariate prediction models?

Table 7.16 shows that the prediction of unit attrition can be best described as moderately successful. Compared to the *c*-statistics and point-biserial correlations obtained for BCT attrition (presented in Chapter 4), the unit values are smaller. Nevertheless, there appears to be some promise of predicting those most prone to attrition (i.e., those scoring in the highest ranges of the prediction composites). Specifically, the utility data from Table 7.16 show that trimming Soldiers who score in the extreme of the distribution (e.g., the upper 10%) would have a beneficial effect on the attrition rate, because these Soldiers attrit at 2-5 times the rate of the total sample. Granted, the attrition rate for these Soldiers remains below 50% for all but those in the Overall attrition sample, so such screening would entail several false negatives (i.e., those identified as high attrition risks but who did not attrit from their units). The degree to which we can predict the different attrition criteria varies, with Performance attrition being most predictable and Other and Pregnancy/Parenthood attrition being least predictable.

6. How well does a theoretical model of attrition, based on the civilian turnover literature, fit Army attrition data?

The theoretical model based on the civilian turnover literature did not fit the Army attrition data well. Much of the mis-specification in the model likely stems from the strong link in the civilian model between attrition cognitions/intentions and attrition behavior. Although the link between cognitive intent and behavior works well for volitional behavior (e.g., civilian turnover), military turnover arguably has a very small volitional component—Soldiers cannot simply choose to leave the Army. Indeed, we believe this is why we see little correlation between job satisfaction and attrition in the Army sample. There are undoubtedly unsatisfied Soldiers who would leave the Army if given the choice. The Army does not give them that choice readily, however, and thus the correlation vanishes. Indeed, many of those who do attrit might very well like the Army and want desperately to stay, yet find themselves unable to attain the Army's required performance standards. Given the lack of volitional attrition in the military context, the failure of the civilian models seems almost certain.

The structural models developed for Overall and Moral Character unit attrition both highlight the importance of deviance and past withdrawal behaviors. As mentioned earlier in this chapter, some of these variables have the significant characteristic of being verifiable (e.g., the Army can verify whether a recruit was expelled or suspended from school). It would appear that such variables hold reasonable promise as markers for those at higher risk for unit attrition—especially later in their Army careers.

7. How well do attitudes and perceptions collected during unit assignment predict unit attrition later in a Soldier's enlistment (e.g., after 18 months of service)?

In accordance with theory, variables assessing more proximal attitudes and perceptions correlated more highly with post-AS01/AS02 attrition than did variables collected earlier in the Soldiers' careers. Tables 7.29 and 7.31 contain larger adjusted correlations than did Table 7.6, again indicating the stronger predictive relationships between proximal attitudes/perceptions and

later unit attrition. Similar sensible patterns of correlation were observed, with variables assessing deviant behavior best predicting Moral Character attrition and variables assessing physical fitness and health best predicting attrition for medical/physical reasons.

8. Do Soldiers vary in their initial status on select attitudinal variables or in the degree to which their attitudes change over time? If so, do any variables assessing individual characteristics help account for this variation?

Soldiers do tend to vary in their initial status on the attitudinal variables examined here. Variation in the degree to which attitudes change over time was less universal, with relatively little variation observed in 3 of the 12 criteria. Table 7.36-7.46 show that the best predictors of initial status and change over time were variables assessing the reasons the Soldier gave for joining the Army. For most of these variables, high scores were indicative of high initial status on the criteria but larger decrements in standing on the criteria over time. Criterion means over time indicate a rather substantial drop in standing between IET and assignment to the units.

CONCLUSIONS

We have demonstrated unit attrition to be a multidimensional construct. Therefore, variables assessing various types of constructs are required to predict it with any semblance of accuracy. Further, the longitudinal analyses presented in this chapter underline the importance of understanding how the phenomenon changes over time. Attrition for performance-related or medical/physical reasons does occur in units (base rates of 4.9% and 5.5% in the total unit attrition analysis sample, accounting for 13.6% and 15.4% of attrition from the sample), but the vast majority of attrition for these reasons occurs during the first few months of unit assignment (these base rates drop to 0.7% and 2.0% in the AS01 sample, accounting for just 4.0% and 11.3% of attrition from the sample that was eligible to complete the AS01 survey—see Table 7.27). Most unit attrition occurs for reasons related to Soldiers' moral character, and its preponderance increases after the first few months in unit. Several variables showed strong predictive relations with attrition, but utility analysis (Table 7.16) indicated that even the best multivariate prediction models would yield a likely unacceptable percentage of false positives (i.e., recruits who would be screened out because they were predicted to attrit but actually would have completed their enlistments).

The structural models of unit attrition support findings from the literature on attrition and turnover: Attrition cognitions are the best predictors of attrition behavior. This relation was less robust in the total-sample models than in the AS01 model, but this is expected given the more distal perceptions and attitudes reported by the SRS and IET surveys (i.e., prior to unit assignment) relative to those captured by the AS01 survey (during unit assignment). The models identified similar precursors of unit attrition and attrition cognitions: Deviance, Positive Army Affect, Efficacy for Performance, and Perceived Fit with the Army appeared in both unit attrition models (i.e., overall, post-AS01). It is notable that more traditional administrative/demographic variables such as education tier and race/ethnicity did not appear in the models. The modeling results show Soldiers' attitudes and perceptions toward the Army to be more powerful indicators of attrition behavior.

The results from the analyses of intraindividual change indicate that many Soldiers become disillusioned with the Army over time. Original ideas, stereotypes, hopes, and fears seem to realign themselves as Soldiers experience Army life firsthand. Without exception, the criteria examined in these analyses changed (on average) toward the more undesirable end of the scale over time. Those Soldiers evidencing lesser degradation of attitudes over time seem to be those who were less "gung ho" to start. It also makes one wonder if SRS items 01c, 01u, and 01aa (which assess if the recruit joined the Army out of a desire to serve our country, to make the Army a career, and for the chance for adventure, respectively) might not serve as a type of response distortion screen. At the very least, high standing on these items seems to correlate with subsequent disillusionment. These results strongly suggest the potential utility of a realistic job preview (RJP). If realignment of Soldier expectations occurred earlier rather than later, it would seem that there would be less chance of such degradation over time. Of course, recruiters might not welcome an RJP, given their already difficult job of finding recruits the Army wants (a characteristic the RJP shares with other plausible interventions, such as selection screens). Results also suggest a need to understand the reasons for waning loyalty, pride, and satisfaction. Perhaps many Soldiers were planning on leaving the Army and hence had begun withdrawal behaviors, leading to worsening feelings regarding the Service.

In sum, the present analyses provide new insights into the characteristics and predictors of unit attrition. Armed with this knowledge, the Army is in better position to predict attrition at the various points in a Soldier's career in general, and at various times after deployment to their unit in particular.

CHAPTER 8: MODELING REENLISTMENT

Huy Le

OVERVIEW

Different from the previous chapters examining attrition, this chapter focuses on a related criterion; that is, the focus here is on the retention of enlisted Soldiers beyond their first term of service. Retaining enlisted Soldiers is of critical importance to the Army because it helps reduce the need to recruit, select, and train replacement Soldiers. Understanding factors influencing Soldiers' reenlistment decisions would enable the Army to develop active and early interventions to manage reenlistment. In this chapter, we hope to provide some initial information that could help the Army achieve that goal. Specifically, we set out to answer the following questions:

1. What factors determine reenlistment behaviors?

2. How can reenlistment be best predicted based on the information (combined across time periods) available to the Army?

3. Which factors influence the development of the determinants for reenlistment over time?

Reenlistment can be seen as the reverse of attrition, similar to the relationship between retention and turnover in civilian organizational research. However, attrition and reenlistment are different in two major dimensions: (1) the time period when these events occur and (2) the degree that Soldiers can control their behaviors (cf., voluntary vs. involuntary turnover; Campion, 1991). Reenlistment is also different from civilian turnover (Hom, Caranikas-Walker, Prussia, & Griffeth, 1992), so it appears that the extant literature does not readily provide information needed to answer the above questions. Therefore, we employed exploratory procedures to examine the issue of reenlistment.

The same longitudinal dataset for Project First Term was analyzed. To answer the first two questions, we employed logistic regression analyses with the criterion being reenlistment status and the predictors being Soldiers' responses to the multiple surveys (i.e., SRS, EOTS-BCT, EOTS-AIT/OSUT, AS01, and AS02) and their military records (the DMDC and EMF data files). We attempted to answer the third question by creating a longitudinal model that specifies the dynamic relationships between the factors influencing Soldiers' reenlistment behaviors over time from their reception in the Army to the time when reenlistment decisions were made. Lacking specific longitudinal theories for reenlistment, we took an exploratory approach to build the model empirically based on (1) results of the previous analyses and (2) related theories of turnover (e.g., Hom & Griffeth, 1995). Details of the analyses are described in the Data Analysis and Results section.

METHODS

Sample

The sample included 19,614 Soldiers whose reenlistment status was available as of March, 31st, 2003. Of those, 9,677 (49.3%) reenlisted. There is a complication, however, because the sample includes 8,407 Soldiers who were classified as "Ineligible for reenlistment." At the same time, 2,528 of those Soldiers were also recorded as "reenlisted." Included in this group may be Soldiers who either (a) had originally been deemed ineligible but later became eligible, or (b) had actually reenlisted and then later became ineligible to reenlist in the next term. Unfortunately, the data do not provide any temporal information of the events that could help us reclassify these cases. Therefore, we had to include all these cases in our analyses, knowing that this confounding problem might potentially distort the findings. On the other hand, it can also be argued that including these confounding cases might make the findings of predictors more robust, as it might lead to detection of only the strongest effects.

Data

Predictor data examined in this chapter include (a) demographic and background information from Army administrative records, (b) Soldier Reception Survey (SRS), (c) End-of-Training Survey collected at the end of basic training (EOTB), (d) End-of-Training Survey gathered at the end of initial entry training (EOTA, which includes both advanced individual training, AIT, and one-station unity training, OSUT), (e) Annual First Term Survey collected in 2001 (AS01), and (f) Annual First Term Survey collected in 2002 (AS02).

Due to the nature of the longitudinal research design, the size of samples available for analyses varies across periods and types of analysis performed, ranging from 855 to 8,832. Table 8.1 shows the sample sizes available for different analyses (details are provided in the next section). Table 8.2 presents demographic and background information on the Soldiers included in the samples as compared with those in the entire FY 99 cohort.

As can be seen in Table 8.1, the base rates (percent of Soldiers who reenlisted) tend to increase over time (i.e., in accordance with the order of administrations of the surveys). Specifically, it appears that those who remained and took the annual survey in 2002 (AS02) were most likely to reenlist (base rate = 56.4% versus 47.1% for those who took the SRS). Although this finding was expected due to sample attrition across times, it can pose problems to the generalizability of findings based on samples including later surveys (e.g., AS02).[61] Because the problems are likely due to range restrictions of the variables of interest, we examined variances of several potentially important predictors that were repeated across administrations (i.e., continuance intention, continuance commitment, affective commitment, satisfaction with leader support, perceived fit, self-rated performance, and self efficacy). The findings indicate that variances of those variables were generally not reduced across the administrations (they actually increased in some cases), which alleviated our concern about range restriction.

[61] Another possible reason for this increasing base rate is that Soldiers had different end-of-term dates, so the sample of those who responded to the annual survey in 2002 might include Soldiers who had already reenlisted. This would exclude those who decided not to reenlist when their first-term of service ended. Unfortunately, our data did not allow us to control for this confounding effect.

Table 8.1. Sample Sizes and Base Rates for Different Analyses

Model	Surveys included in the Model [1]	Sample Size	Reenlist	Not Reenlist	Base Rate (% reenlist)
1	SRS only	8,832	4,156	4,676	47.1%
2	EOTS (BCT) only	6,343	3,138	3,205	49.5%
3	EOTS (AIT/OSUT) only	7,745	3,747	3,998	48.4%
4	AS01 only	7,116	3,476	3,640	48.8%
5	AS02 only	6,155	3,470	2,685	56.4%
6	AS02 & AS01	2,553	1,418	1,135	55.5%
7	AS01 & EOTS (AIT/OSUT)	2,972	1,437	1,535	48.4%
8	AS01 & EOTS (BCT)	2,083	1,035	1,048	49.7%
9	AS01 & SRS	3,391	1,631	1,760	48.1%
10	EOTS (AIT/OSUT) & EOTS (BCT)	2,664	1,378	1,286	51.7%
11	EOTS (AIT/OSUT) & SRS	5,029	2,402	2,627	47.8%
12	EOTS (BCT) & SRS	3,649	1,800	1,849	49.3%

Note. [1] Analyses for some combinations of surveys (e.g., AS02, EOTS-AIT/OSUT, and EOTS-BCT) were not performed because results of previous analyses based on a subset of such combinations (e.g., AS02 and EOTS-BCT) show that adding more variables does not improve predictabilities of the model.

Analysis

We first examined factors predicting Soldiers' reenlistment from each survey separately (i.e., SRS, EOTS-BCT, EOTS-AIT/OSUT, AS01, and AS02). Logistic regression was used in these analyses. Because there were a large number of potentially useful variables examined and relatively smaller sample sizes available for the current analyses, the ratios of sample sizes to variables were substantially smaller for the reenlistment analyses than they were for the attrition analyses reported in earlier chapters. Accordingly, there was concern about the problem of capitalizing on chance (i.e.,the statistical significance attained by certain variables would be more likely due to sampling error than to actual relations with the criterion). We addressed this concern by adopting an exploratory-confirmatory two-staged approach to determine the best predictors for the reenlistment criterion. Specifically, we randomly split the sample into two sub-samples, an exploratory sub-sample with approximately two thirds of the original sample and a confirmatory/validation sub-sample including the remaining one third of the cases.

Stepwise (logistic) regression analyses were then applied to the exploratory sub-sample to select the most efficient predictors in each survey. We used a statistical significance level of .05 as the inclusion criterion. Next, prediction models based on those predictors were re-evaluated with the validation sample. The predictors were reselected based on their performance in the validation sample. Finally, we estimated parameters for the prediction models with the re-selected predictors using the entire sample.

To answer the second question, we combined predictors (selected from the procedures described above) across multiple surveys to create new prediction models.[62] Various combinations

[62] These analyses might involve the same variables measured on different occasions/surveys (e.g., continuance intention measured by the EOTS and AS01), so multicolinearity could potentially pose certain problems in those models. We examined the correlations of all the variables across time/surveys and found most of them were lower than .600. Consequently multicolinearity was unlikely to be a problem. To further examine the matter, we carried out additional multicolinearity diagnoses. None of the models examined showed signs of multicolinearity problems.

Table 8.2. Demographic Composition of Analysis Samples vs. FY99 Cohort

	FY99 Cohort		Sample for Model 1		Sample for Model 2		Sample for Model 3		Sample for Model 4		Sample for Model 5		Sample for Model 6	
Group	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Gender														
Male	51,107	79.9	8,073	91.4	5,311	83.7	7,039	90.9	6,372	89.5	5,426	88.2	2,277	89.2
Female	12,823	20.1	759	8.6	1,032	16.3	706	9.1	744	10.5	729	11.8	276	10.8
Race														
White	38,361	60.0	5,045	57.1	3,191	50.3	4,350	56.2	4,094	57.5	3,349	54.4	1,483	58.1
Black	15,325	24.0	2,024	22.9	1,886	29.7	1,841	23.8	1,593	22.4	1,537	25.0	546	21.4
Hispanic	6,890	10.8	1,216	13.8	853	13.4	1,078	13.9	996	14.0	898	14.6	382	15.0
Other	3,354	5.2	547	6.2	413	6.5	476	6.1	433	6.1	371	6.0	142	5.6
AFQT Category														
I	2,306	3.6	213	2.4	137	2.2	200	2.6	199	2.8	189	3.1	82	3.2
II	18,799	29.4	1,935	21.9	1,346	21.2	1,769	22.8	1,619	22.8	1,393	22.6	593	23.2
IIIa	18,247	28.5	1,909	21.6	1,497	23.6	1,744	22.5	1,689	23.7	1,392	22.6	597	23.4
IIIb	22,447	35.1	4,392	49.7	3,052	48.1	3,683	47.6	3,227	45.3	2,870	46.7	1,159	45.4
IV-V	2,009	3.1	374	4.2	304	4.8	341	4.4	376	5.3	303	4.9	120	4.7
Education Tier														
1	55,432	86.7	7,610	86.2	5,502	86.7	6,590	85.1	6,128	86.1	5,412	87.9	2,238	87.7
2	7,966	12.5	1,150	13.0	796	12.5	1,083	14.0	933	13.1	708	11.5	297	11.7
3	285	0.4	43	0.5	27	0.4	34	0.4	31	0.4	20	0.3	14	0.5
Totals	63,938		8,832		6,343		7,745		7,116		6,155		2,553	

Table 8.2. (Continued)

	FY99 Cohort		Sample for Model 7		Sample for Model 8		Sample for Model 9		Sample for Model 10		Sample for Model 11		Sample for Model 12	
Group	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Gender														
Male	51,107	79.9	2,719	91.5	1,728	83.0	3,137	92.5	2,214	83.1	4,704	93.5	3,210	88.0
Female	12,823	20.1	253	8.5	355	17.0	254	7.5	450	16.9	325	6.5	439	12.0
Race														
White	38,361	60.0	1,754	59.0	1,068	51.3	2,034	60.0	1,281	48.1	2,918	58.0	1,898	52.0
Black	15,325	24.0	612	20.6	578	27.7	670	19.8	839	31.5	1,090	21.7	1,035	28.4
Hispanic	6,890	10.8	417	14.0	282	13.5	476	14.0	355	13.3	705	14.0	480	13.2
Other	3,354	5.2	189	6.4	155	7.4	211	6.2	189	7.1	316	6.3	236	6.5
AFQT Category														
I	2,306	3.6	78	2.6	46	2.2	85	2.5	56	2.1	128	2.5	78	2.1
II	18,799	29.4	709	23.9	432	20.7	749	22.1	552	20.7	1,114	22.2	788	21.6
IIIa	18,247	28.5	660	22.2	516	24.8	743	21.9	594	22.3	1,078	21.4	818	22.4
IIIb	22,447	35.1	1,401	47.1	993	47.7	1,681	49.6	1,345	50.5	2,478	49.3	1,815	49.7
IV-V	2,009	3.1	122	4.1	94	4.5	131	3.9	115	4.3	229	4.6	146	4.0
Education Tier														
1	55,432	86.7	2,550	85.8	1,792	86.0	2,937	86.6	2,283	85.7	4,247	84.5	3,174	87.0
2	7,966	12.5	392	13.2	270	13.0	421	12.4	358	13.4	732	14.6	444	12.2
3	285	0.4	15	0.5	15	0.7	23	0.7	12	0.5	27	0.5	20	0.5
Totals	63,938		2,972		2,083		3,391		2,664		5,029		3,649	

Note. Sample for Model 1 = Soldiers with both the SRS survey data and reenlistment status. Model 2 = Soldiers with both the EOTS(BCT) survey data and reenlistment status. Model 3 = Soldiers with both the EOTS(AIT/OSUT) survey data and reenlistment status. Model 4 = Soldiers with both the AS01 survey data and reenlistment status. Model 5 = Soldiers with both the AS02 survey data and reenlistment status. Model 6 = Soldiers with both the AS01 and AS02 survey data and reenlistment status. Model 7 = Soldiers with both the AS01 and EOTS(AIT/OSUT) survey data and reenlistment status. Model 8 = Soldiers with both the AS01 and EOTS(BCT) survey data and reenlistment status. Model 9 = Soldiers with both the AS01 and SRS survey data and reenlistment status. Model 10 = Soldiers with both the EOTS(AIT/OSUT) and EOTS(BCT) survey data and reenlistment status. Model 11 = Soldiers with both the EOTS(AIT/OSUT) and SRS survey data and reenlistment status. Model 12 = Soldiers with both the EOTS(BCT) and SRS survey data and reenlistment status.

were examined. While it was expected that models created by combining predictors from surveys most proximal to the reenlistment criterion (i.e., AS02 and AS01) would be the most predictive (Ajzen & Fishbein, 1980; Hom et al., 1992), models combining more distal predictors (i.e., SRS, EOTS-BCT, and EOTS-AIT) were also potentially useful. Such models would provide information needed for the Army to engage in early intervention to improve reenlistment.

Sets of predictors in each administration were entered into the regression models sequentially to examine their incremental contributions above and beyond those of existing predictors in estimating the re-enlistment criterion. Only the best predictors were retained.

Results of all analyses discussed above provided piecemeal information about the relationships among the variables influencing reenlistment decisions across time. We attempted to integrate those findings to build a longitudinal model specifying relationships between determinants for reenlistment behaviors. Additional regression analyses were carried out to determine additional variables to be included in the model (i.e., predictors of continuance intention—described below in more detail in the Results section) and their relationships. Formulation of the model was based on existing theories of turnover (e.g., Hom & Griffeth, 1995) and reasoned action (Ajzen & Fishbein, 1980). As such, the model was constructed both empirically and rationally. We describe steps involved in constructing the model in more detail below.

RESULTS

Best Predictors in Each Survey

As noted above, we split the sample into two subsamples. The exploratory sample included 12,570 cases (with a reenlistment rate of 49.8%), and the validation sample had 7,044 cases (with a reenlistment rate of 48.5%).[63] The difference between these rates was not statistically significant. Differences on other demographic variables (e.g., age, gender, level of education) in the subsamples were also insignificant.

As explained in the Data Analysis section, we first carried out analyses for variables in each survey separately. Stepwise regression was used on the exploratory subsample to select the best set of predictors for the reenlistment criterion. The predictors were next reselected with the validation subsample. The final models were evaluated using the whole sample. Tables 8.2 to 8.6 show the selected predictors and statistics of the final models estimated from the entire sample[64]. Specifically, the tables display the regression coefficient B for each predictor and the corresponding standard errors (SE) and odds ratios (ORs). For the full models (including all the variables), c-statistics and point-biserial correlations (r_{pb}) between probabilities predicted by the Models and observed reenlistment status are reported. To facilitate evaluating the predictabilities of the survey variables, we also reported those statistics for models including only the background information provided in the Army's records (the DMDC and EMF data).

[63] Actual sizes of these subsamples vary depending on types of analyses, as indicated in Table 8.1.

[64] In these and subsequent tables, refer to the survey booklets in Appendix A for the precise wording of the questions in the various surveys. In each table, we identify the survey and the question/response option number, and provide only a very short extract. The wording of the question stem is often crucial to understanding that extract.

Table 8.3. Model 1 – SRS Predictors

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables:					
Marital status at entry[2]	0.497	0.082	1.644	1.400	1.930
African American	0.355	0.055	1.426	1.280	1.589
Having alternative high school diploma	0.167	0.072	1.182	1.026	1.361
BMI category	-0.105	0.021	0.900	0.864	0.938
High quality recruit	-0.205	0.025	0.815	0.776	0.856
Model based on only DMDC variables: c = .611 (95%CI = .599-.622) ; r_{pb} =.217					
SRS Variables:					
Continuance intention	0.275	0.024	1.317	1.256	1.380
Parent(s) in the Army (SRS11)	0.248	0.057	1.281	1.146	1.433
Participated in athletic team (SRS26a)	0.138	0.031	1.148	1.080	1.220
Military vs. Civilian - overall evaluation	0.172	0.035	1.128	1.075	1.183
Full Model: c = .654 (95% CI = .642 - .666) ; r_{pb} = .268					

Note. n=8,454. Base rate (Reenlistment rate) = .469. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2] This variable was coded as follows; Married = 1; Single=0.

Table 8.4. Model 2 – End of Training – BCT Predictors

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Marital status at entry[2]	0.421	0.086	1.523	1.287	1.803
African American	0.421	0.059	1.523	1.357	1.710
Having alternative high school diploma	0.181	0.086	1.198	1.013	1.418
BMI category	-0.097	0.025	0.908	0.864	0.953
High quality recruit	-0.323	0.058	0.724	0.646	0.811
Model based on only DMDC variables: c = .610 (95% CI = .596 - .624) ; r_{pb} = .185					
EOTS-BCT Variables					
Continuance intention	0.202	0.016	1.400	1.329	1.475
Career commitment change (EOTB09)	0.121	0.029	1.127	1.065	1.192
Family situation makes leaving difficult (EOTB39: Continuance commitment)	0.046	0.024	1.055	0.999	1.115
Full Model: c = .656 (95% CI = .643 - .670) ; r_{pb} = .271					

Note. n=6,191. Base rate (Reenlistment rate) = .493. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2] This variable was coded as follows; Married = 1; Single=0.

Table 8.5. Model 3 – End of Training – AIT/OSUT Predictors

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Marital status at entry[2]	0.486	0.086	1.626	1.374	1.924
African American	0.420	0.059	1.522	1.356	1.709
BMI category	-0.082	0.025	0.921	0.877	0.968
High quality recruit	-0.433	0.058	0.649	0.579	0.727
Model based on only DMDC variables: c = .607 (95% CI = .595 - .620) ; r_{pb} = .197					
EOTS-AIT/OSUT Variables					
Continuance intention	0.203	0.015	1.245	1.206	1.286
Career commitment change (EOTA09)	0.125	0.025	1.154	1.091	1.220
Family situation makes leaving difficult (EOTA39: Continuance commitment)	0.082	0.022	1.146	1.067	1.231
Full Model: c = .662 (95% CI = .649 - .674); r_{pb} = .281					

Note. n = 7,573. Base rate (Reenlistment rate) = .483. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2] This variable was coded as follows; Married = 1; Single=0.

Table 8.6. Model 4 – Annual Survey (2001) - AS01 Predictors

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables:					
Marital status at entry[2]	0.271	0.089	1.311	1.101	1.561
African American	0.245	0.066	1.278	1.123	1.454
BMI category	-0.049	0.025	0.952	0.907	1.000
High quality recruit	-0.294	0.060	0.745	0.663	0.838
Model based on only DMDC variables: c = .597 (95% CI = .584 - .610) ; r_{pb} = .203					
AS01 Variables:					
Continuance intention	0.668	0.027	2.355	2.200	2.520
Continuance Commitment	0.154	0.029	1.174	1.107	1.246
Career commitment change (AS0108)	0.118	0.027	1.156	1.083	1.234
Satisfaction with Army medical care	0.093	0.026	1.107	1.047	1.171
Satisfaction with leaders: Performance expectation	-0.117	0.040	0.916	0.864	0.971
Full Model: c = .767 (95% CI = .756 - .778) r_{pb} = .458					

Note. n = 6,931. Base rate (Reenlistment rate) = .488. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2]This variable was coded as follows; Married = 1; Single=0.

Table 8.7. Model 5 – Annual Survey (2002) - AS02 Predictors

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Having alternative high school diploma	0.631	0.121	1.895	1.495	2.402
BMI category	-0.060	0.032	0.942	0.885	1.003
High quality recruit	-0.377	0.074	0.686	0.593	0.793
Model based on only DMDC variables: c = .617 (95% CI = .603 - .631) ; r_{pb} =.209					
AS02 Variables					
Continuance intention	1.615	0.061	5.028	4.461	5.666
Continuance commitment	0.238	0.037	1.291	1.194	1.395
Career commitment change (AS0206)	0.202	0.034	1.289	1.185	1.401
Important people support reenlistment (AS0236)	0.162	0.032	1.227	1.134	1.328
Plan to attend college (AS0224)	0.137	0.033	1.202	1.102	1.310
Satisfaction with leaders: Performance expectation	-0.203	0.052	0.864	0.803	0.930
Important people disappointed if dropped out (AS0235)	-0.156	0.029	0.818	0.761	0.880
Full Model: c = .886 (95% CI = .877 - .895) r_{pb} = .682					

Note. n=5,962. Base rate (Reenlistment rate) = .565. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported.

As can be seen in the tables, the predictabilities of the models increase substantially over time. In other words, the models' predictabilities are the function of the proximity between the administrations of the surveys and the criterion (reenlistment). The increases are mostly due to the increasing association between continuance intention and reenlistment over time. This finding clearly agrees with the Theory of Reasoned Action (Ajzen & Fishbein, 1980).

It is also important to note that although a rather large number of diverse variables were examined, very similar sets of best predictors were retained in the final models. Specifically, continuance intention, career commitment change, and continuance commitment were included in all the models except for Model 1 with SRS predictors.[65] As for background variables, marital status at entry, having an alternative diploma, "high quality recruit" group membership (a classification scheme based on Soldiers' education level at entry and their AFQT scores), ethnicity (African American vs. other racial subgroups), and BMI category (as defined by the Centers for Disease Control) were consistently found to predict the criterion across time (models). This consistency enables us to postulate certain relationships among the variables across time, which then served as the building blocks for the longitudinal model of reenlistment. Specifically, it could be inferred that the effects of attitudinal and perception variables (e.g.,

[65] Items eota39 and eotb39 ("family situation makes leaving difficult") were the same as the items as0111m and as0209m included in AS01 and AS02 surveys which were used to form the Continuance Intention scales (together with another item, "lack of good alternative"). Thus, we considered these items (eota39 and eotb39) as an indicator (albeit a psychometrically unreliable one) of the Continuance Intention construct.

satisfaction, organizational commitment, perceived fit, self efficacy) *at each time period* on the reenlistment criterion were mostly mediated by those variables retained by the models, most probably by continuance intention.

Determining the Best Sets of Predictors by Combining Surveys

We next attempted to combine the best predictors for each time period to determine the best predictive models of reenlistment. From the findings in the previous section, it was expected that the best predictive model would include predictors from surveys most proximal to the criterion (i.e., the annual surveys in 2001 and 2002). To verify this, we sequentially added new sets of predictors to the existing models and examined if the additions would improve overall model fit. Adding AS01 predictors to the model that already included AS02 predictors (Model 5 above) indeed resulted in significant improvement in model fit.

Similarly, the AS02 predictors were found to contribute significantly to the fit of the model that included only AS01 predictors (Model 4 above). Taken together, the results confirmed that a new model combining AS01 and AS02 predictors would predict reenlistment better than Models 4 or 5 individually. Table 8.7 shows the resulting model (Model 6) with redundant predictors (i.e., variables that were originally included in Models 4 or 5 but failed to contribute significantly to the fit of the combined model) excluded. As noted, continuance intention measured in 2001 was no longer predictive of the criterion when AS02 predictors were added so it was dropped out of Model 6. This finding suggested that the predictive effect of AS01 continuance intention on the criterion was fully mediated by AS02 predictors, probably by AS02 continuance intention.

Table 8.8. Model 6: Combining Annual Survey 2002 (AS02) and Annual Survey 2001 (AS01)

Variables	B	SE	OR[1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Having an alternative diploma	0.525	0.194	1.690	1.156	2.473
High quality recruit	-0.412	0.122	0.662	0.521	0.841
AS02 Variables					
Continuance intention	1.833	0.102	6.253	5.120	7.636
Continuance commitment	0.277	0.061	1.346	1.184	1.530
Plan to attend College (AS0224)	0.207	0.054	1.251	1.116	1.402
Career commitment change (AS0206)	0.157	0.056	1.218	1.061	1.398
Important people support reenlistment (AS0236)	0.137	0.054	1.193	1.041	1.367
Important people disappointed if quit (AS0235)	-0.154	0.048	0.848	0.766	0.938
AS01 Variables					
Career commitment changed (AS0108)	0.176	0.051	1.239	1.097	1.400
Satisfaction with leaders: Performance expectation	-0.249	0.083	0.833	0.740	0.939
Full Model: c = .903 (95% CI = .891 - .916) r_{pb} = .719					

Note. n=2,448. Base rate (Reenlistment rate) = .558. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1] For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported.

Table 8.8 shows that Model 6 can predict reenlistment very well, yielding an estimated c-statistic of .903. The point-biserial correlation between the predicted probabilities generated by the model and observed reenlistment was .719. Table 8.9 further illustrates the predictive capability of the model. As can be seen, the model correctly classifies Soldiers' enlistment behaviors in 85% of the cases when a cutoff value of 50% was used.

Table 8.9. Using Model 6 to Predict Soldiers' Reenlistment – Classification Table

Observed	Predicted		Percentage Correct
	No- Did NOT Re-enlist	Yes- Reenlisted	
No- Did NOT Re-enlist	904	177	83.6%
Yes- Reenlisted	201	1,166	85.3%
Overall Percentage			84.6%

Note. The cut value is .500

Our next attempts to combine predictors from earlier administrations (i.e., EOTS-AIT/OSUT, EOTS-BCT, and SRS) with the AS02 predictors were unsuccessful. Following the same procedure described above, we found that while adding the AS02 predictors to existing models including predictors from earlier surveys (i.e., Models 1, 2, and 3) would result in significant improvements in model fit, the reverse was not true. Thus, it appeared that the effects of predictors from earlier surveys were fully mediated by those in AS02, which were more proximal to reenlistment decisions. Models including both the AS02 variables and variables from either EOTS-IT/OSUT, EOTS-BCT, or SRS, therefore, were not presented.

The same procedure was then followed to examine the incremental validities of new combined models to Model 4 (AS01 predictors only), Model 3 (EOTS-AIT/OSUT predictors only), and Model 2 (EOTS-BCT predictors only). As noted earlier, while we expected that those combined models would be unlikely to perform better than Model 6, that combines more proximal (AS01 and AS02) predictors, they are likely to have important practical values to the Army. Tables 8.10, 8.11, and 8.12 show the models combining AS01 predictors with EOTS-AIT/OSUT, EOTS-BCT, and SRS predictors, respectively.

The tables show that those models combining predictors from the annual survey in 2001 and predictors from one earlier survey have reasonable predictive capabilities, with c-statistics ranging from .769 to .780 (point biserial correlations from the models' predicted probabilities and actual reenlistment range from .447 to .483). Though these indexes cannot compare to those provided by Model 6 (Table 8.8), they indicate that reenlistment can be predicted early (i.e., almost two years before the behavior happened) with reasonable degrees of accuracy.

It can also be seen in the tables that continuance intentions measured from previous periods remained predictive even though continuance intention measured by the annual survey 2001 was included in the models. Effects from other predictors in previous time periods, however, vanished, except for those in the SRS surveys (srs11: Parent(s) in the Army and srs26a: Participated in athletic team). Subsequent analyses showed that adding more sets of predictors

into Models 7, 8, and 9 did not improve the fit of these models. Thus, models including ASO1 predictors and two other sets of predictors from previous periods are not presented.

Table 8.10. Model 7: Combining Annual Survey 2001 (AS01) and End of Training Survey – AIT/OSUT

Variables	B	SE	OR[1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
High quality recruit	-0.362	0.087	0.696	0.587	0.826
AS01 Variables					
Continuance intention	0.750	0.050	2.608	2.301	2.956
Continuance commitment	0.155	0.046	1.174	1.070	1.289
Career commitment change (AS0108)	0.093	0.027	1.120	1.050	1.195
Satisfaction with leaders: Performance expectation	-0.151	0.062	0.895	0.819	0.979
EOTS-AIT/OSUT Variables					
Continuance intention	0.108	0.027	1.193	1.094	1.300
Full Model: c = .780 (95% CI = .764 - .797) r_{pb} = .483					

Note. n=2,894. Base rate (Reenlistment rate) = .481. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported.

Table 8.11. Model 8: Combining Annual Survey 2001 (AS01) and End of Training Survey –BCT

Variables	B	SE	OR[1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Having alternative diploma	0.373	0.152	1.452	1.078	1.956
African American	0.345	0.112	1.412	1.134	1.759
AS01 Variables					
Continuance intention	0.586	0.054	2.115	1.847	2.421
Career commitment change (AS0108)	0.132	0.051	1.175	1.040	1.327
Satisfaction with Army medical care	0.125	0.05	1.145	1.030	1.273
Continuance commitment	0.115	0.054	1.127	1.010	1.257
Satisfaction with leaders: Performance expectation	-0.182	0.075	0.875	0.786	0.975
EOTS-BCT Variables					
Continuance intention	0.137	0.031	1.249	1.132	1.378
Full Model: c = .769 (95% CI = .749 - .789) r_{pb} = .457					

Note. n=2,026. Base rate (Reenlistment rate) = .495. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported.

Table 8.12. Model 9: Combining Annual Survey 2001 (AS01) and Soldier Reception Survey (SRS)

Variables	B	SE	OR[1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables:					
African American	0.306	0.102	1.358	1.112	1.659
BMI category	-0.084	0.037	0.919	0.855	0.989
High quality recruit	-0.396	0.089	0.673	0.565	0.801
AS01 Variables					
Continuance intention	0.685	0.041	2.400	2.166	2.659
Continuance commitment	0.213	0.042	1.247	1.145	1.358
SRS Variables					
Continuance intention	0.170	0.041	1.310	1.153	1.489
Participated in athletic team (SRS26a)	0.120	0.055	1.127	1.012	1.256
Parents in the Army (SRS11)	0.205	0.101	1.228	1.007	1.496
Full Model: c = .776 (95% CI = .760 - .792) r_{pb} = .447					

Note. n=3,246. Base rate (Reenlistment rate) = .480. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported.

Models combining multiple sets of predictors from End of Training surveys (EOTS-AIT/OSUT and EOTS-BCT) and the Soldier Reception Survey (SRS) are shown in Tables 8.13 (Model 10: EOTS-AIT/OSUT and EOTS-BCT), 8.14 (Model 11: EOTS-AIT/OSUT and SRS), and 8.15 (Model 12: EOTS-BCT and SRS). The model including all these three sets of predictors did not provide any better fit than these models and therefore is not presented.

Finally, we attempted to examine a model including variables from all the surveys (SRS, EOTS-BCT, EOTS-AIT/OSUT, AS01, and AS02) and Army records. Variables retained for this model, however, turned out to be exactly the same as those included in Model 6 discussed earlier.

It is evident from these results that models combining predictors from these earlier surveys were not as predictive as models that included more proximal surveys. The c-statistics of Models 10, 11, and 12 ranged from .660 to .669 (point-biserial correlations ranged from .280 to .296). Nevertheless, these results show that Soldiers' reenlistment behaviors could be predicted, albeit with a moderate degree of accuracy, as early as when they have just started their service.

This finding is in line with the suggestion by Hom and his colleagues (1992) that Army recruits form their withdrawal decisions (or similarly reenlistment decisions) very early compared with employees in civilian organizations. However, the relatively low predictabilities of variables measured at earlier periods and the increasing predictabilities of the models over time indicate that Soldiers gradually evolved their reenlistment decisions throughout their first-term of service. This suggests that the Army can actively influence reenlistment decisions if factors determining such decisions over time are known. In the following section, we describe our attempt to better understand these factors by constructing the longitudinal model of reenlistment based on the findings gathered so far.

Table 8.13. Model 10: Combining End of Training Survey – AIT/OSUT (EOTA) and End of Training Survey –BCT (EOTB)

Variables	B	SE	OR[1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Marital status at entry[2]	0.372	0.128	1.451	1.129	1.864
African American	0.324	0.090	1.383	1.159	1.649
BMI category	-0.112	0.038	0.894	0.830	0.963
High quality recruit	-0.385	0.086	0.680	0.575	0.805
EOTS-AIT/OSUT Variables					
Continuance intention	0.094	0.034	1.166	1.046	1.300
Career commitment change (EOTA09)	0.136	0.046	1.000	1.000	1.000
EOTS-BCT Variables					
Continuance intention	0.127	0.033	1.229	1.106	1.365
Career commitment change (EOTB09)	0.098	0.047	1.097	1.006	1.197
Full Model: c = .660 (95% CI = .639 - .681) r_{pb} = .280					

Note. n=2,565. Base rate (Reenlistment rate) = .513. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2] This variable was coded as follows; Married = 1; Single=0.

Table 8.14. Model 11: Combining End of Training Survey – AIT/OSUT) and Soldier Reception Survey (SRS)

Variables	B	SE	OR[1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Marital status at entry[2]	0.398	0.108	1.489	1.205	1.840
African American	0.337	0.075	1.401	1.209	1.623
BMI category	-0.109	0.028	0.897	0.849	0.947
High quality recruit	-0.393	0.069	0.675	0.590	0.773
EOTS-AIT/OSUT Variables					
Continuance intention	0.138	0.023	1.252	1.164	1.348
Career commitment change (EOTA09)	0.127	0.032	1.141	1.069	1.219
Continuance commitment (EOTA39)	0.065	0.028	1.077	1.012	1.146
SRS Variables					
Parent(s) in the Army (SRS11)	0.236	0.078	1.266	1.087	1.475
Continuance intention	0.087	0.023	1.148	1.069	1.234
Military vs. Civil: Overall evaluation	0.140	0.048	1.097	1.031	1.168
Full Model: c = .669 (95% CI = .654 - .684) r_{pb} = .296					

Note. n=4,800. Base rate (Reenlistment rate) = .475. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2] This variable was coded as follows; Married = 1; Single=0.

Table 8.15. Model 12: Combining End of Training Survey – BCT (EOTB) and Soldier Reception Survey (SRS)

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
Marital status at entry[2]	0.502	0.124	1.652	1.296	2.107
African American	0.378	0.081	1.459	1.245	1.710
Having an alternative diploma	0.223	0.116	1.250	0.996	1.569
BMI category	-0.125	0.033	0.882	0.827	0.941
High quality recruit	-0.312	0.078	0.732	0.628	0.853
EOTB Variables					
Continuance intention	0.128	0.029	1.231	1.122	1.350
Career commitment change (EOTB09)	0.135	0.039	1.136	1.057	1.221
SRS Variables					
Participated in athletic team (SRS26a)	0.160	0.050	1.174	1.064	1.294
Continuance intention	0.153	0.048	1.165	1.061	1.280
Parent(s) in the Army (SRS11)	0.197	0.089	1.218	1.023	1.450
Full Model: c = .663 (95% CI = .645 - .681) r_{pb} = .284					

Note. n=3,471. Base rate (Reenlistment rate) = .492. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported. [2] This variable was coded as follows; Married = 1; Single=0.

Longitudinal Model of Reenlistment

Continuance Intention as the Major Predictor of Reenlistment

As discussed earlier, the consistent findings that only a limited set of variables including Continuance Intention, Continuance Commitment, and Career Commitment Change were predictive of reenlistment across time periods suggest that effects of other attitudes and perceptions were fully mediated by these variables. Close examination of these three consistent predictors reveals that they were indeed reflected in the existing models of turnover (Hom & Griffeth, 1995). Specifically, Continuance Intention in the current research is the same as the construct of Withdrawal Cognitions in Hom and Griffeth's integrative model (Figure 6.1; Hom & Griffeth, 1995). Continuance Commitment can be conceptualized as Expected Utility of Withdrawal, the construct determining turnover (or reenlistment) behavior in addition to the effect of Withdrawal Cognition (or Continuance Intention in the current investigation).

The construct of Career Commitment Change, on the other hand, was not mentioned in turnover theories. Since Career Commitment Change (the change in Soldiers' attitudes across time) was not explicitly discussed in existing theories of turnover, we believe the finding that this construct contributes incrementally in predicting the reenlistment criterion could have important implications, theoretically and practically. In our attempt to build a longitudinal model of reenlistment, including the construct should help model the change of relevant attitudinal constructs over time, thereby simplifying the model significantly.

The current findings can also be conceptualized as reflecting Fishbein and Ajzen's theory of reasoned action (Fishbein & Ajzen, 1975; Sackett & Mavor, 2002). The theory of reasoned action suggests that Behavior Intention (Continuance Intention) is the main predictor of behavior, with Environmental Constraints and Abilities and Skills also contributing additively and interactively. The construct of Continuance Commitment included in our investigation can be broadly seen as reflecting Soldiers' perception of Environmental Constraints. To further explore the explanatory power of the theory to our data (and thereby construct our model), we carried out additional analyses, examining the effects of those variables. Environmental Constraints were operationalized in the current research by Continuance Commitment; the Abilities construct was operationalized using Soldiers' AFQT categories. Further, we also looked at the potential moderating effect of Soldiers' self efficacy (perceived abilities/skills) on the path from Continuance Intention to reenlistment behavior. These analyses were carried out using the AS02 variables, the most proximal variables to the criterion. Essentially, this means that we examined the improved fit of the enhanced models created by adding the main and interaction effects of the variables discussed above to Model 5.

Results, however, generally did not confirm those suggested by the Theory. Most effects examined did not significantly contribute to improving the fit of Model 5. Surprisingly, only the main and interaction effects of Self Efficacy were found to be significant, but the directions of these effects were opposite to those expected. As shown in Table 8.16, it appears that for those Soldiers having higher self efficacy, their Continuance Intentions are less likely to lead to reenlistment decisions, as compared to those who have lower self efficacy. Further, Soldiers having high self efficacy are less likely to reenlist. These findings contradict what is predicted by the theory. We unfortunately do not have a good substantive explanation for these counter-intuitive effects.

A closer examination of Table 8.16 revealed that adding the effects of Self Efficacy, though improving the model fit statistically significantly ($-\Delta 2LL = \Delta\chi^2 = 41.95$; $p < .001$ with df=2), resulted in virtually no improvement in the model's predictabilities (i.e., the c-statistics and point-biserial correlations remain the same as those in Model 5 without the effects). Further investigation showed very small effects of Self Efficacy on the relationship between Continuance Intention and Reenlistment: The correlation between these variables is .526 for those scoring in the upper one-third of Self Efficacy, whereas it is .559 for those in the lower one-third. Given this substantively negligible effect, we did not pursue the issue further.

Determinants of Continuance Intention

The existing theories of turnover and reasoned action suggest that all the effects of attitudinal and perceptual variables (e.g., job satisfaction, organizational commitment) were mediated by intention (Hom & Griffeth, 1995). In other words, intention was determined by those attitudinal and perceptual constructs. This was basically borne out by results of our analyses, as discussed above. In addition, it is possible that previous intentions at least partially determine current intentions (i.e., intention is relatively temporally stable) (Harrison & Martocchio, 1998). We thus expected that Continuance Intention formed in earlier time periods, together with attitudinal and perceptual variables (e.g., satisfactions, commitment), would jointly influence later Continuance Intention.

Table 8.16. Examining the Interaction Effect of Self Efficacy on the Intention-Reenlistment Relationship

Variables	B	SE	OR [1]	95% CI of OR Min	95% CI of OR Max
DMDC Variables					
High quality recruit	-0.386	0.074	0.680	0.588	0.786
Having an alternative diploma	0.634	0.122	1.885	1.484	2.394
BMI category	-0.063	0.032	0.939	0.882	1.000
AS02 Variables					
Continuance intention	1.722	0.064	5.596	4.936	6.344
Continuance commitment	0.217	0.037	1.262	1.168	1.364
Career commitment change (AS0206)	0.197	0.035	1.280	1.175	1.396
Plan to attend college (AS0224)	0.142	0.033	1.165	1.086	1.248
Important people disappointed if quit (AS0235)	-0.158	0.029	0.816	0.759	0.878
Important people support reenlistment (AS0236)	0.157	0.032	1.219	1.126	1.320
Model without the effects of Self Efficacy: c = .886 (95% CI = .877 - .895) r_{pb} = .682					
Additional Effects from Self Efficacy					
Self Efficacy on performing military tasks (main effect)	-0.129	0.048	0.879	0.800	0.966
Interaction term between continuance intention and self efficacy	-0.338	0.051	0.700	0.630	0.778
Full Model: c = .886 (95% CI = .877 - .895) r_{pb} = .682					

Note. n=5,958 . Base rate (Reenlistment rate) = .566. Positive coefficients mean the higher the predictor values (for categorical variables, values coded as 1), the higher the likelihood that Soldiers would re-enlist. [1]For composite scales (or items with responses assumed to be continuous), standardized odd ratios are reported.

A series of stepwise (linear) regression analyses with dependent variables being the Continuance Intention measured in each survey (SRS, EOTS-BCT, EOTS-AIT/OSUT, AS01, and AS02) and independent variables being all the other variables included in the same survey and Continuance Intention measured by the earlier, most recent survey (except for SRS) were carried out. Results of the analyses are displayed in Tables 8.17 to 8.21. In these tables (except for Table 8.17 which shows determinants of initial Continuance Intention at the beginning of the first-term of service), we first present the models with only Continuance Intention from the previous time period. Then, we show the full model with all the variables entered. This order of presentation provides an idea of the extent that Continuance Intention was changed by the influences of other factors included in the models.

Table 8.17. Factors Determining Soldiers' Initial Continuance Intention (Soldier Reception Survey - SRS)

	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
Make Army a career (SRS01u)	0.633	0.007	0.525
Reasons for leaving Army - All reasons	0.100	0.024	0.171
Attrition cognitions	-0.251	0.016	-0.125
Entry enlistment term –recoded[1]	0.322	0.016	0.106
Reasons for joining Army – Personal growth	-0.176	0.011	-0.099
Work I enjoy most is available (SRS47)	0.156	0.010	0.085
Reasons for leaving Army - Problems adjusting	-0.427	0.079	-0.081
Military versus. Civilian Life – Time for Personal Life	0.079	0.012	0.051
Generalized self efficacy	0.093	0.014	0.049
Participation in high school activities	0.047	0.005	0.048
Affective commitment	0.082	0.013	0.045
Family problems at home (SRS57c)	-0.153	0.029	-0.044
High quality recruit	-0.147	0.027	-0.044
Importance of core army values - Duty, integrity, and personal courage	-0.068	0.010	-0.040
Continuance commitment	0.068	0.010	0.038
Never thought about quitting HS (SRS25a)	-0.125	0.019	-0.034
Injuries during training (SRS57n)	-0.119	0.032	-0.033
Marital status at entry (S/M)	0.179	0.030	0.033
Youth program participation	0.210	0.033	0.032
Reasons for joining Army - Family/friends influence	-0.049	0.008	-0.032
Better job outside the Army (SRS57m)	-0.126	0.032	-0.032
Repayment of loans (SRS01s)	-0.038	0.006	-0.031
AFQT Category at entry	-0.054	0.015	-0.030
Pregnancy (SRS57d)	-0.162	0.038	-0.028
Don't have any uncertainty (SRS54a)	0.095	0.018	0.028
Army advertising (SRS01a)	-0.040	0.007	-0.028
Illness/medical condition (SRS57g)	-0.110	0.034	-0.026
Reasons for leaving Army – Deviance	-0.233	0.111	-0.026
Reasons for leaving Army – Discrimination	-0.217	0.087	-0.025

Table 8.17 (Continued)

	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
Not getting desired military job (SRS57o)	-0.094	0.031	-0.025
Ethnicity: Black	0.097	0.022	0.024
Reasons for quitting previous jobs	0.022	0.005	0.024
Military versus. Civilian Life – Overall	0.055	0.020	0.023
College when enlistment term is up (SRS21)	-0.045	0.010	-0.022
Poor academic performance (SRS57f)	-0.129	0.042	-0.021
Wife/Husband/Girlfriend/Boyfriend (SRS02d)	0.086	0.023	0.020
Center for Disease Control BMI category	0.028	0.008	0.018
Service member (SRS02j)	0.080	0.022	0.018
Haven't had job outside the home (srs38a)	0.126	0.036	0.018
Ethnicity: Hispanic	-0.095	0.028	-0.018
Current level of morale (SRS59)	0.029	0.010	0.016
Parent career active military (SRS11)	0.061	0.021	0.014
R^2 = .512 (Adjusted R^2 = .511)			

Note. n =20,638. Predictors are sorted by the absolute magnitudes of their standardized beta-weights. [1]This variable was recoded as follows: Two-year term =1; Three-year term =2; Four-year term =3.

Table 8.18. Factors Determining Soldiers' Continuance Intention at the End of Basic Training (EOTS-BCT Survey)

	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
Model with only stability effect of Continuance intention from previous period (SRS)			
Continuance intention (SRS)	0.680	0.012	0.667
$R^2 = .445$			
Model with previous Continuance intention plus more proximal factors (EOTS-BCT variables) and background variables			
Continuance intention (SRS)	0.525	0.011	0.515
Affective commitment	0.297	0.036	0.128
Work I enjoy most is available (EOTB29)	0.218	0.023	0.108
Efficacy for performance	0.212	0.038	0.095
Entry enlistment term –recoded[1]	0.199	0.033	0.064
Reluctant to leave for bit more (EOTB15c)	0.072	0.016	0.050
Important to complete enlistment (EOTB51)	0.098	0.026	0.050
None of the above (unsure about Army career; EOTB54g)	0.170	0.036	0.050
Importance of core Army values – Duty, integrity, and personal courage	-0.098	0.027	-0.048
Military vs. Civilian life - Time for personal life	0.070	0.019	0.043
Holding an alterative diploma	0.189	0.058	0.034
Job performance (self-rated)	0.066	0.025	0.033
Significant other supportive Army career (EOTB48)	0.050	0.017	0.032
Physical fitness	-0.062	0.028	-0.031
Youth Program participation	0.210	0.071	0.030
Being away from family and friends (EOTB25n)	0.050	0.018	0.030
Difficult to have family life (reversed) (EOTB15er)	0.044	0.017	0.029
Incidents of discrimination	0.118	0.042	0.029
AFQT Category at entry	0.049	0.020	0.026
Advise female about joining Army (EOTB41)	0.095	0.046	0.024
Satisfaction with supervision - Leader support	-0.049	0.026	-0.023
Going to college (EOTB50)	0.043	0.020	0.022
Family situations make leaving difficult (EOTB39)	0.028	0.015	0.020
$R^2 = .572$ (Adjusted $R^2 = .569$) ; $\Delta R^2 = .127$			

Note. n =4,238. Predictors are sorted by the absolute magnitudes of their standardized beta-weights. [a] This variable was recoded as follows: Two-year term =1; Three-year term =2; Four-year term =3.

Table 8.19. Factors Determining Soldiers' Continuance Intention at the End of Training AIT/OSUT (EOTS-AIT/OSUT Survey)

	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
Model with only stability effect of Continuance Intention from previous period (EOTS-BCT)			
Continuance intention (EOTS – BCT)	0.648	0.015	0.647
$R^2 = .418$			
Model with previous Continuance Intention plus more proximal factors (EOTS-AIT/OSUT variables) and background variables			
Continuance intention (EOTS – BCT)	0.487	0.015	0.486
Satisfaction with Army life	0.270	0.056	0.115
Work I enjoy most is available (EOTA29)	0.212	0.032	0.102
Reluctant to leave for bit more (EOTA15c)	0.127	0.022	0.090
Affective commitment	0.152	0.049	0.071
Entry enlistment term –recoded[1]	0.205	0.042	0.066
Important to complete enlistment (EOTA51)	0.081	0.031	0.049
Military versus Civilian Life - Time for personal life	0.088	0.027	0.049
Significant other supportive Army career (EOTA48)	0.062	0.021	0.042
Discipline (EOTA25e)	-0.062	0.023	-0.040
Going to college (EOTA50)	0.072	0.027	0.037
Medical problems during training (EOTA13)	0.119	0.046	0.035
Family situations make leaving difficult (EOTA39)	0.051	0.021	0.034
Efficacy for performance	0.069	0.039	0.033
$R^2 = .548$ (Adjusted $R^2 = .545$) ; $\Delta R^2 = .130$			

Note. n = 2,580. Predictors are sorted by the absolute magnitudes of their standardized beta-weights. [1] This variable was recoded as follows: Two-year term =1; Three-year term =2; Four-year term =3.

Table 8.20. Factors Determining Soldiers' Continuance Intention in 2001 (Annual Survey 2001 – AS01)

	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
Model with only stability effect of Continuance Intention from previous period (EOTS-AIT/OSUT)			
Continuance intention (EOTS-AIT/OSUT)	0.246	0.011	0.325
$R^2 = .105$			
Model with previous Continuance Intention plus more proximal factors (AS01 variables) and background variables			
Career commitment change (AS0108)	0.261	0.015	0.254
Work I enjoy most is available (AS0130)	0.235	0.018	0.173
Continuance intention (EOTS-AIT/OSUT)	0.120	0.009	0.159
Entry enlistment term –recoded[1]	0.271	0.027	0.120
Continuance commitment	0.145	0.016	0.120
Affective commitment	0.166	0.026	0.115
Military versus Civilian life - Time for a personal life	0.115	0.022	0.078
Military versus Civilian life - Job characteristics	0.046	0.009	0.078
Marital status at entry[2]	0.321	0.048	0.077
Efficacy for performance	0.095	0.022	0.064
Satisfaction with work itself	-0.081	0.020	-0.059
Holding an alterative diploma	0.206	0.048	0.050
Planning to go to college (AS0127)	0.056	0.014	0.046
Perceived procedural justice	0.052	0.015	0.040
Job performance (self-rated)	0.045	0.018	0.033
$R^2 = .467$ (Adjusted $R^2 = .465$) ; $\Delta R^2 = .362$			

Note. n= 4,133. Predictors are sorted by the absolute magnitudes of their standardized beta-weights. [1] This variable was recoded as follows: Two-year term =1; Three-year term =2; Four-year term =3. [2] This variable was coded as follows; Married = 1; Single=0.

Table 8.21. Factors Determining Soldiers' Continuance Intention in 2002 (Annual Survey 2002 – AS02)

Variables	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
Model with only stability effect of Continuance Intention from previous period (AS01)			
Continuance intention (AS01)	0.588	0.014	0.542
$R^2 = .293$			
Model with previous Continuance Intention plus more proximal factors (AS02 variables) and background variables			
Continuance intention (AS01)	0.317	0.013	0.292
Career commitment change (AS0206)	0.264	0.016	0.241
Most important people support reenlisting (AS0236)	0.177	0.014	0.160
Work I enjoy most is available (AS0231)	0.171	0.018	0.116
Affective commitment	0.167	0.027	0.103
Continuance commitment	0.120	0.016	0.091
Planning to go to college (AS0224)	0.112	0.015	0.083
Military versus Civilian life - Job characteristics	0.037	0.010	0.055
Possible reasons for leaving Army - All reasons	-0.032	0.007	-0.049
Entry enlistment term –recoded[1]	0.136	0.030	0.048
Montgomery GI Bill (AS0225)	-0.168	0.041	-0.043
Satisfaction with supervision - Leader expectations	-0.084	0.031	-0.043
Unit leadership supportive of reenlisting (AS0237)	0.057	0.015	0.043
Gender[2]	-0.170	0.044	-0.042
Disappointed if I dropped out of Army	-0.044	0.013	-0.039
Satisfaction with supervision - Leader support	-0.056	0.029	-0.034
Perceived procedural justice	0.045	0.016	0.031
Military versus Civilian life - Time for personal life	0.044	0.022	0.026
Workload	0.015	0.007	0.021
$R^2 = .568$ (Adjusted $R^2 = .566$); $\Delta R^2 = .273$			

Note. n = 4,019. Predictors are sorted by the absolute magnitudes of their standardized beta-weights. [1]This variable was recoded as follows: Two-year term =1; Three-year term =2; Four-year term =3. [2] This variable was coded as follows; Female = 1; Male=0.

Results shown in the tables confirmed our expectations; that is, Continuance Intention was largely determined by earlier intention *and* other attitudinal and perceptual variables (approximately 50% of the variance in measures of intentions could be explained by the variables included in the models). It is worth noting that the effect of Continuance Intention measured by the EOTS (AIT/OSUT) on subsequent intention reported in the first annual survey

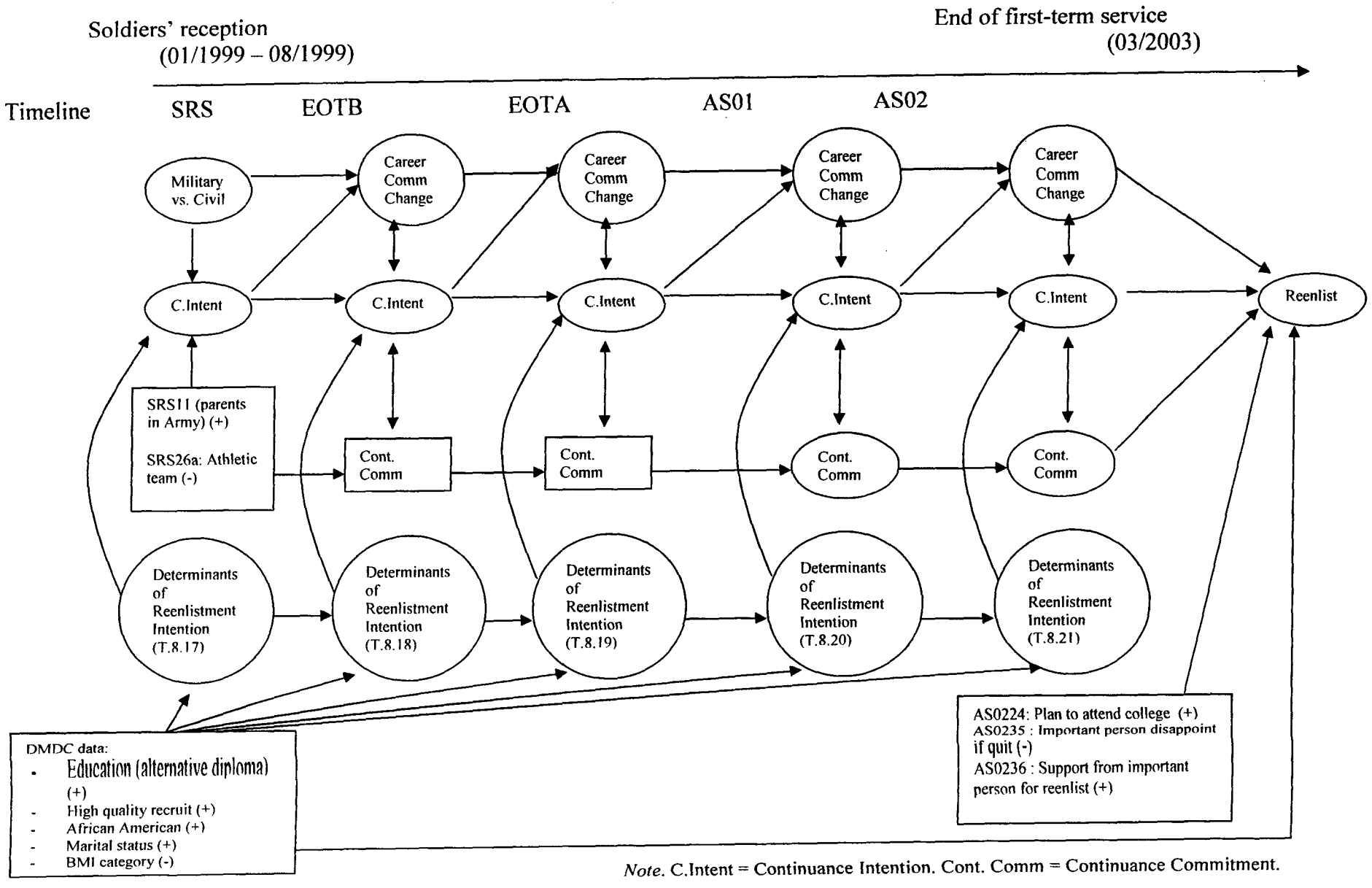
AS01 (Table 8.20) was markedly smaller (R^2=.105) than those during other periods (R^2 ranges from .295 to .445). This finding suggested that there was a discontinuity in the development of Soldiers' intentions at the end of their training periods. Perhaps this was the time when Soldiers re-adjusted their career intentions when facing real experiences in the Army.

A closer examination of the results further revealed a rather surprising finding that satisfaction variables were generally not included as determinants of Continuance Intention. When they were actually included, the sign of their effects was often negative (e.g., Satisfaction with Supervisor—Leader Expectations, standardized beta-weight is -.043; Table 8.20), suggesting suppressor effects. Probably this finding indicates that the effects of satisfaction on Continuance Intention were mostly mediated by other factors, possibly organizational commitment constructs (affective and continuance). This postulation in fact agrees with some earlier research findings about the causal relationships of these constructs (e.g., Bateman & Strasser, 1984; Williams & Hazer, 1986). We examined this possibility by partially testing the longitudinal model, as described in the next section.

Putting It All Together – The Longitudinal Model of Reenlistment

Based on results of our analyses discussed earlier, we suggested the model connecting determinants of reenlistment across five different time periods represented by the administrations of the surveys. Figure 8.1 presents that model. As can be seen, the model suggests that Continuance Intention, Continuance Commitment, and Career Commitment Change are the three main determinants for reenlistment behaviors. These constructs are believed to be somewhat stable, as evidenced by the arrows connecting them across time periods. However, other variables which are temporally more proximal (represented by the circles in the model with numbers [e.g., T.8.17] referring to the tables that show all the determinants for Continuance Intention in that time period) also exert influence on the constructs. Effects of those variables on reenlistment are suggested to be mediated mostly by Continuance Intention. There are exceptions, however. As can be seen in the figure, empirical evidence showed that three factors still have incremental effects on reenlistment: (1) plan to attend college, (2) influence from significant other on quitting, and (3) support from significant other on reenlistment. These factors can be broadly conceptualized as Environmental Constraints (plan to attend college) and social norms (support from significant other on reenlistment). The remaining factor, which has a negative effect on reenlistment (influence from significant other on quitting behaviors), could probably also be interpreted as a social norm. That is, this norm might have acted to keep in the Army Soldiers who would otherwise have attrited early. Understandably, those Soldiers were unlikely to reenlist for a second term. The negative effects of satisfaction variables were more difficult to explain, so we did not include them in the model.

As discussed earlier, the effect of changes in Continuance Intention was modeled by the construct Career Commitment Change. Accordingly, the model prescribes that there are arrows from earlier Continuance Intention to Career Commitment Change. These arrows, together with those from current Continuance Intention, are used to operationalize the effects of changes (Edwards & Parry, 1993).



Note. C.Intent = Continuance Intention. Cont. Comm = Continuance Commitment.

Figure 8.1 The Longitudinal Model of Soldiers' Reenlistment

Admittedly, the model suggested herein is tentative. Unfortunately, we could not fully test it empirically due to various practical reasons. Specifically, despite the fact that we have a large dataset, the sample size available to test the entire model is smaller than 180, which is too small to test models with many variables. More important, however, it is not possible to test the model on the same data used to derive it. Nevertheless, we attempted to partially verify the structural relationships among important variables suggested in the model by examining a simplified model including only variables from AS01 and AS02. In addition, we also examined the plausibility of the postulation about the indirect effects of satisfaction on intention (via organizational commitment) discussed above.

Figure 8.2 shows the simplified model tested. This model does not include all the determinants of Continuance Intention found in Table 8.20 and Table 8.21 because here we were only interested in the relationships among major variables shown in the original model (Figure 8.1). We used the 10 satisfaction scales included in each survey as indicators for the General Satisfaction construct. As can be seen in Figure 8.2, the model specified that the effects of Satisfaction on Intention were mediated via Affective Commitment and Continuance Commitment. Further, Satisfaction at Time 1 (AS01) was allowed to influence Commitments at Time 2 (AS02).

All the variables were assumed to be relatively temporally stable, i.e., constructs at Time 2 were partly determined by the same constructs at Time 1. The model also specifies the path from Continuance Intention at Time 1 to Career Commitment Change at Time 2, which, as discussed earlier, signifies the change in Intention across time. Further, we specified correlated errors for the same items administered across time (Marsh & Hocevar, 1988; these specifications were not shown in Figure 8.2). LISREL 8.30 was used for the analysis.

Results showed that the data reasonably fit the model (χ^2 = 16,582.70, *df*=858, CFI = .89; RMSEA = .060; SRMR = .049). Table 8.22 provides the model parameter estimates. Compared to the cutoff criteria recently recommended by Hu and Bentler (1999), the Comparative Fit Index (CFI) is low (.89 vs. .95). However, the other indices, RMSEA and SRMR, met the suggested cutoffs (which are .060 and .080 for RMSEA and SRMR, respectively). Given the fact that the model tested here was a simplified version of a more complicated model involving many other variables, we believe that these fit statistics provide initial evidence supporting the patterns of relationships between the constructs suggested in our main longitudinal model.

Annual Survey 2001 (AS01) *Annual Survey 2002 (AS02)*

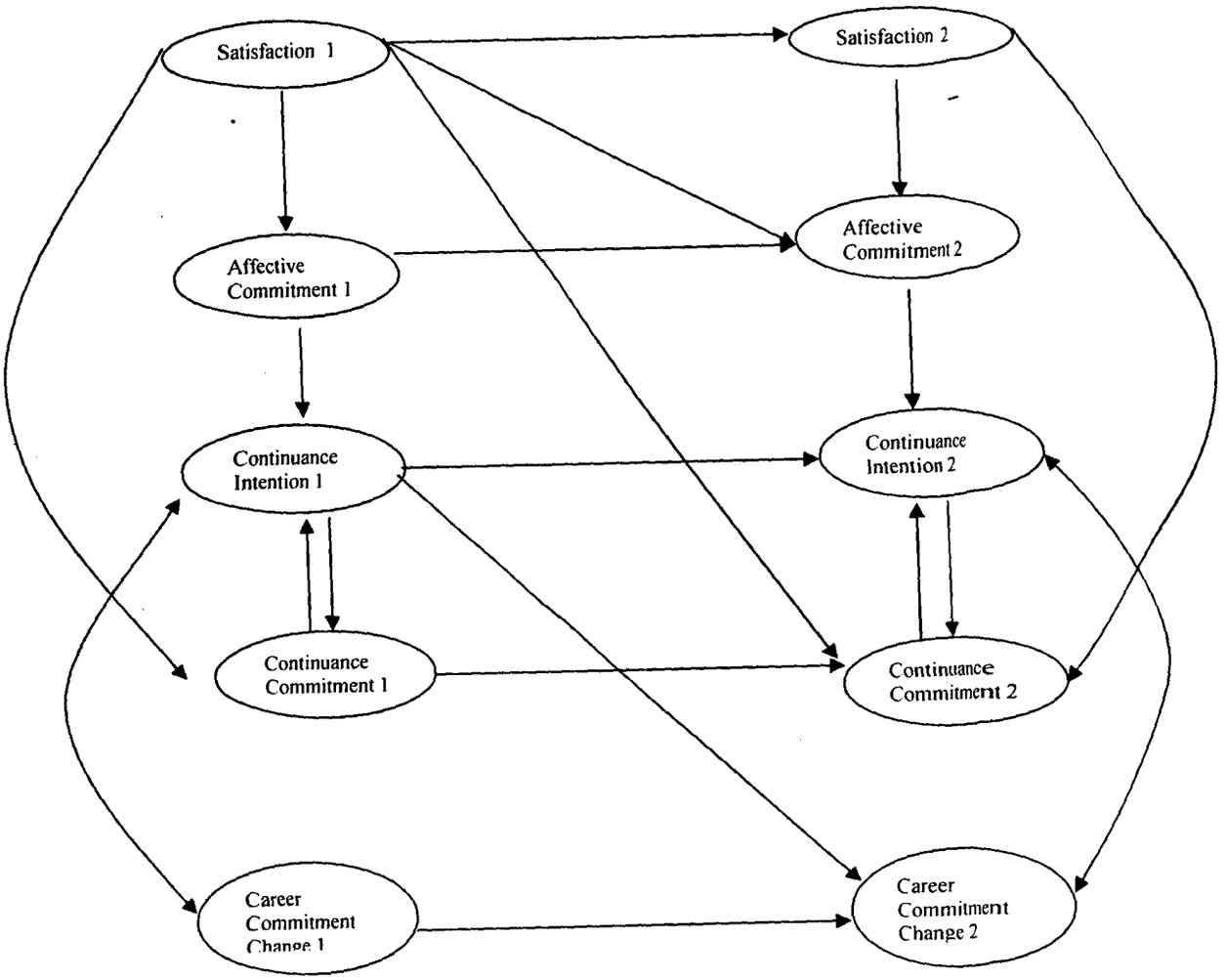


Figure 8.2. Simplified Model of Determinants of Continuance Intention Tested in the Research

Table 8.22. Parameter Estimates and t-Statistics for the Simplified Longitudinal Model of Reenlistment

Outcome/Predictor	b^1	t
Affective Commitment 1 (AS01)		
Job Satisfaction 1 (AS01)	0.89	21.72
Continuance Intention 1 (AS01)		
Affective Commitment 1	2.60	15.09
Career Commitment Change 1	-1.50	-13.72
Continuance Commitment 1	0.79	9.74
Continuance Commitment 1 (AS01)		
Job Satisfaction 1	0.44	13.04
Continuance Intention 1	0.13	7.20
Career Commitment Change 1 (AS01)		
Continuance Intention 1	1.03	39.73
Job Satisfaction 2 (AS02)		
Job Satisfaction 1	0.64	32.73
Affective Commitment 2 (AS02)		
Job Satisfaction 2	0.90	32.43
Affective Commitment 1	0.65	19.22
Job Satisfaction 1	-0.48	-16.26
Continuance Intention 2 (AS02)		
Continuance Intention 1	0.54	19.68
Affective Commitment 2	1.97	16.93
Career Commitment Change 2	-1.41	-12.85
Continuance Commitment 2	0.74	11.16
Continuance Commitment 2 (AS02)		
Continuance Commitment 1	0.55	19.41
Job Satisfaction 2	0.49	14.85
Job Satisfaction 1	-0.34	-9.32
Continuance Intention 2	0.07	4.66
Career Commitment Change 2 (AS02)		
Continuance Intention 2	1.11	37.21
Continuance Intention 1	-0.52	-17.72
Career Commitment Change 1	0.24	12.58

Note. n=5,050. [1] Un-standardized path estimates. For each outcome, predictors are sorted in descending order by average magnitude of their t-statistic. Path estimates with t-statistics that exceed 1.65 are statistically significant ($p <$ .05, one-tailed).

SUMMARY OF MAIN FINDINGS

Below is a summary of the results associated with the three research questions we examined.

1. What factors determine reenlistment behaviors?

This research shows that reenlistment could be predicted reasonably well by information available in surveys administered to Soldiers during reception, training, and in units, together with their military records. As expected, information obtained from surveys that are more proximal to reenlistment provides better prediction of the criterion.

Among the predictors, several background variables were consistently found to influence reenlistment behaviors. Married Soldiers were more likely to reenlist, perhaps due to the fact that they were more mature and had a better sense of their future careers by the time they joined the Army. Overweight Soldiers (as indicated by BMI categories) tended not to reenlist. Reenlistment rate was also found to be higher among African Americans. Those who held alternative certificates (e.g., GED holders) were more likely to reenlist, as compared to Soldiers with high school diplomas. As expected, those Soldiers who were classified as "High quality recruits" tended not to reenlist after their first-term of service. While the Army would like to retain those Soldiers, many of them likely enlisted for Army College Fund benefits, with the expectation that they would leave after one term of service to pursue college. Those Soldiers were confident of their abilities to complete college and find good civilian jobs, and therefore they were less likely to remain in the Army.

Other predictors for reenlistment were provided in surveys administered to Soldiers as part of the current project. As evident in Tables 8.3 – 8.7, these predictors were actually more important in determining Soldier reenlistment behaviors. At the time of reception, Soldiers' overall evaluations of Army benefits as compared to those of civilian counterparts predicted reenlistment above and beyond their initial Continuance Intention. Participation in high school athletics and having a parent who was career active-duty military were also predictive of subsequent reenlistment. It was surprising, however, that satisfaction with leaders (leaders' performance expectation) was negatively related to reenlistment after Continuance Intention measured by the two annual surveys was taken into account. As postulated earlier, this was probably a statistical artifact (suppressor effect). Unfortunately, we do not have any substantive explanation for this counterintuitive finding.

For all the surveys, three factors were consistently found to predict reenlistment across times: Career Commitment Change, Continuance Commitment, and Continuance Intention. This finding is consistent with that suggested by the theory of reasoned action (Fishbein & Ajzen, 1975).

2. How can reenlistment be best predicted based on the information (combined across time periods) available to the Army?

As shown in Table 8.9, the regression model including independent variables available in the two most proximal surveys (AS01 and AS02) and Soldiers' background data could predict the reenlistment criterion at a great degree of accuracy (85% accurate). Thus, it is possible to

form a composite based on information obtained from the Soldiers' DMDC file and their responses to the AS01 and AS02 to predict Soldiers' subsequent enlistment behaviors. Earlier, more distal surveys (i.e., the EOTS and SRS) did not provide any incremental information that could improve the predictive power of the composite.

In the absence of the AS02, earlier surveys yielded less predictive composites, with the combination of EOTS(AIT/OSUT) and EOTS(BCT) providing the least information about the reenlistment criterion (Table 8.13). Nevertheless, it is encouraging that even surveys administered as early as when the Soldiers have just entered the Army could be useful to predict their reenlistment behaviors years later.

3. Which factors influence the development of the determinants for reenlistment over time?

The model presented in this chapter is our first attempt to answer this question by integrating current empirical findings and relevant theories of turnover. It shows that reenlistment is likely to be determined by three main factors: Continuance Intention, Continuance Commitment, and Career Commitment Change. These factors mediate effects from other attitudinal and organizational factors (e.g., Satisfaction, Affective Commitment) on reenlistment. They also interact with one another and change over time.

While the model could not be fully tested in the current research, we believe it reasonably reflects the relationships among the determinants of reenlistment across time. We hope it can serve as a starting point for future research. The Army can use the model as an organizing framework to plan interventions aimed at managing reenlistment.

CONCLUSIONS

The research conducted here shows that Continuance Intention was the most powerful predictor of reenlistment. This finding is expected because intention is the most proximal determinant of behaviors, as suggested by the theory of reasoned action (Fishbein & Ajzen, 1975). The longitudinal model of reenlistment intuitively demonstrates that reenlistment could be influenced by interventions aimed at factors determining Continuance Intention. Hence we conclude the chapter by briefly discussing the findings pertaining to Continuance Intention.

Our analyses (Tables 8.17-8.21) reveal that Continuance Intention was determined by many factors, some of which could be influenced by the Army (e.g., unit leader's support for reenlistment, perceived procedural justice). Further, Continuance Intention is somewhat stable for short time-periods and minimally stable for longer periods, as later intention was partly determined by those formed in earlier time periods. As mentioned earlier, Continuance Intention measured at the time of Soldiers' reception (SRS) could still predict reenlistment behaviors 4 years later. This finding bears out Hom et al. (1992)'s assertion that recruits form their withdrawal cognition as early as the time they enter the Army. While this information can be helpful for the Army to develop a process to manage subsequent reenlistment, it does not mean that the intention is fixed and cannot be changed. In fact, the opposite is true. As evident in Tables 8.17 – 8.21, other factors substantially influence Continuance Intention over time (ΔR^2 = .127 - .362).

To further illustrate this point, we present in Table 8.23 the bivariate correlations among Continuance Intention across time and between Continuance Intention and reenlistment. It can be seen therein that even though correlations between Continuance Intentions measured at two proximal time periods are generally high (larger than .50, except that between EOTA and AS01), Continuance Intention measured at the time of reception (i.e., by the Soldier Reception Survey) only has a modest correlation with that in the second annual survey in 2002 (.238). As mentioned earlier, further examination of the tables (8.17 – 8.21) reveals that the stability of Continuance Intention dropped abruptly during the period after Soldiers completed their training (i.e., between those measured by EOTA and AS01 surveys). It was possible that the Soldiers re-adjusted their expectations, and attitudes (and consequently, intentions) when faced with the real tasks in the Army. Conceivably, end of training would be the critical period for the Army to administer intervention measures to manage reenlistment.

Table 8.23. Correlations among Continuance Intentions Across Time

	SRS Continuance Intention	EOTS (BCT) Continuance Intention	EOTS (AIT/OSUT) Continuance Intention	AS01 Continuance Intention	AS02 Continuance Intention
SRS Continuance Intention					
EOTS (BCT) Continuance Intention	.662				
EOTS (AIT/OSUT) Continuance Intention	.552	.653			
AS01 Continuance Intention	.278	.329	.329		
AS02 Continuance Intention	.238	.276	.253	.540	
Reenlistment Status	.194	.213	.216	.419	.572

Note. n = 4,658 – 11,356.

CHAPTER 9: RECOMMENDATIONS

Rodney A. McCloy and William J. Strickland

OVERVIEW

This report provides the results of numerous analyses of the Project First Term dataset—a remarkably rich information source for those wishing to understand various forms of attrition and reenlistment behavior in the Army. Its longitudinal nature and multiple variables assessing individual, organizational, and extra-organizational factors—including repeated measures (for many variables, and for the entire End-of-Training Survey [EOTS])—provide researchers the opportunity to test empirically myriad hypotheses of both theoretical and practical import. Although the analyses presented in the preceding chapters address many important issues, they are far from exhaustive. For example, we did not have the opportunity to address questions of intra-individual change (e.g., assessing whether various individual characteristics help predict changes in Soldiers' attitudes across time). Nevertheless, the results reported herein have the potential to inform Army policy regarding attrition and reenlistment during the first term of service. In this chapter, we present some recommendations for how the Army might wish to proceed in light of the analytic results from this expansive, data-rich project.

ATTRITION

The Army pays dearly for first-term attrition. Although some attrition benefits the Army by allowing those ill-suited for duty to leave, attrition costs remain substantial, ranging from $700 million to $1.2 billion for a given cohort of enlisted accessions (see Chapter 1). Direct costs include lost investments in equipment, training, and recruiting, as well as transportation, lodging, and compensation costs in the form of salary during enlistment and subsequent unemployment costs (Laurence, 1993; McCloy et al., 1992). Attrition also entails a number of indirect costs, both to the military (e.g., lowered morale, force instability) and the Soldier (e.g., reduced future employment opportunities and earning potential; Laurence, 1993). To date, the Services have used high school diploma graduate status as an indicator of a recruit's chances of completing his/her first term, a practice spurred by early Air Force research (Flyer, 1959) and since justified by years of supporting evidence (e.g., Department of Defense, 1985).

Despite the occasionally beneficial effects of attrition, both the overall first-term attrition rate and the attrition rate from Initial Entry Training (IET) remain higher than the Army would like. In particular, the in-unit attrition rate approximating 25% (two-thirds of total first-term attrition) is undesirably high. In recent briefings, Army Accessions Command (AAC) has expressed an interest in "front-loading" Army attrition—encouraging inevitable attrition (i.e., *necessary* attrition) to occur as early in IET as possible. The desire, then, is to reduce the number of Soldiers who leave later in IET or after assignment to their operational units. One advantage of such an approach would be the reduction of direct costs such as compensation during service (salary) and indirect costs such as force instability (i.e., Soldiers would not leave their units at the rate they do presently).

The data presented in this report (particularly in Chapter 7) indicate that AAC likely will not realize its wishes *in toto*, although additional front-loading appears feasible. One primary hurdle to the front-loading strategy lies in the nature of first-term attrition. The findings across chapters with regard to the composition of attrition (i.e., what types of attrition occur when) are quite consistent, and they demonstrate that the nature of attrition changes across the first term—particularly in the operational unit. Specifically, early attrition in both IET and the unit is due primarily to performance and medical/physical factors. As discussed in Chapter 3, attrition due to performance and medical/physical concerns accounts for approximately 80% of all attrition in the first 6 months of service. Beyond 6 months, Moral Character attrition becomes more prevalent (approximately 60% of all attrition occurring between 2 and 3 years of service and nearly 50% of attrition thereafter). Pregnancy/Parenthood attrition also increases, but Performance and Medical/Physical attrition rapidly wanes. Attrition later on in the unit stems primarily from deviance-related issues (see Chapters 3 and 7). Because the reasons for in-unit attrition change, it will not be possible to "shift" *all* attrition forward in time. Therefore, any gains from front-loading attrition would likely entail Performance and Medical/Physical attrition. Simply put, the type of Soldier who attrits in unit is not the same type of Soldier who attrits in IET. Such differences exist, in part, because of the defining characteristics of the IET and in-unit phases of the first term. Because these characteristics are unlikely to change, it is not a simple matter to "front load" attrition.

The differential composition of attrition over time implies that the most effective predictors/interventions (as well as their optimal collection point or timing) will vary, depending on the type of attrition and timeframe of interest. With regard to the goal of front-loading attrition, this dictum suggests that, depending on the intervention, only certain types of attrition (namely, attrition due to medical/physical and performance reasons) could be front-loaded, whereas other types (e.g., attrition due to moral character) would remain unaffected. One possible action to effect front-loading would be to increase Basic Combat Training (BCT) performance standards to those applied to Soldiers in Advanced Individual Training (AIT) and in units. Presently, BCT physical standards are somewhat less stringent than core Army standards that the Army begins to apply during AIT.

It is not surprising, then, that the preponderance of AIT attrition occurs because of performance and medical/physical reasons. Increased BCT standards would more quickly disqualify those Soldiers who could not attain the Army's standards. Other Soldiers who succeed under the current system, however, also would attrit under more stringent BCT requirements. Yes, Soldiers who pass the present BCT standards but fail to meet standards during AIT or in their units would attrit sooner, but the Army would also lose those Soldiers who eventually met BCT and AIT standards but did so more slowly (our data suggest there are probably more of the latter than the former). Therefore, forcing attrition to occur earlier would likely increase overall attrition, and worse yet, lead to the loss of Soldiers who would otherwise have eventually met the standards. As a result, the nature of Army first term attrition leads us to conclude that reducing overall attrition rates and front-loading attrition may well prove to be incompatible goals.

Another consideration regards the cost tradeoff between reducing overall attrition and increasing recruiting demands likely to follow from this strategy. The Department of Defense's recruit quality benchmarks currently stipulate that no more than 10% of the enlisted force can hold a nontraditional education credential or be non-graduates. Note, however, that the

benchmark does not require *all* recruits to possess high school diplomas. The reason for allowing a modicum of high-risk recruits from Tiers 2 and 3 to enlist lies in the prohibitive cost of *not* allowing them to enlist. Any attempt to reduce attrition through additional screening procedures would likely have recruiting cost implications. The costs would likely differ a bit from those estimated by the Department's cost-performance tradeoff model (CPTM; McCloy et al., 1992) because the screens would involve variables that the CPTM does not presently consider (e.g., past deviant behavior, time in the Delayed Entry Program [DEP]). Thus, any changes to the selection and/or retention systems will have other (and perhaps far-reaching) effects on other components of those systems.

Strategies for Managing First-Term Attrition

What, then, should be done to address first-term attrition (which changes in character over time)? There are several possibilities. In general, they involve one or more of the following three actions: (a) identification and screening of high-risk recruits, (b) application of post-enlistment interventions, or (c) implementation of Army-wide programs designed to address antecedents of attrition. Specifically, consider the following approaches:

1. Identify high-risk recruits and bar them from enlisting.
2. Identify high-risk recruits, allow them to enter, but require them to meet higher standards on other criteria that might decrease their risk of attrition
3. Identify high-risk recruits, allow them to enter, but require them to participate in a DEP program designed to reduce their risk of attrition.
4. Relatedly, identify high-risk recruits, allow them to enter, but require them to participate in the DEP for a mandatory, longer period of time (e.g., a minimum of 3 months).
5. Train supervisors who interact with high-risk Soldiers to help those Soldiers adjust to the demands of the Army.
6. Implement programs across-the-board to address the precursors to attrition.

Option 1 serves more as a strawperson than as a sensible option. As mentioned above, the Army currently enlists a certain number of high-risk recruits (i.e., those with lower levels of education or those who require an enlistment waiver). Option 2 gives the Army more flexibility, in that it would allow a greater percentage of high-risk recruits to enter and yet mitigate their risk by requiring them to meet higher standards on other selection criteria. Such a strategy is consistent with the current approach of approving (or denying) enlistment waivers for recruits who have shortcomings in various areas (e.g., medical, physical, moral character), depending on their standing on other valued selection criteria (e.g., Armed Forces Qualification Test [AFQT] scores), as well as efforts to identify the most promising recruits from among those lacking high school diplomas (i.e., the GED Plus program; Putka & McCloy, 2004). Nevertheless, both options assume we can identify *prior to entry* recruits who are at high risk of attrition. In this project, we demonstrated that it is possible to identify high-risk Soldiers *prior to IET* (we did not collect any survey data prior to entry).

One concern about pre-entry attrition screens would be the potential for recruits to falsify their responses to the items that predicted attrition in this project. For example, it would be easy for a recruit to say he or she had never thought about quitting high school. It would also be easy for recruiters to coach recruits on how to "beat" such a screen. As demonstrated in earlier chapters, however, other items from the Project First Term survey battery that demonstrated reasonable validity have the desirable quality of *verifiability*. We certainly cannot verify whether a recruit ever thought about quitting high school, but it is a matter of record whether the recruit was expelled or suspended. Therefore, response distortion does not render as infeasible a screening procedure for identifying recruits who pose high attrition risks.

Unlike the first two options, the remaining options would not require identification of high-risk recruits prior to entry into the DEP. For these options, risk assessments made after entry into the DEP (but prior to IET) would suffice. The challenge with implementing such post-entry assessments falls less on concerns over response distortion and more on how such recruits would be handled once "tagged" as high attrition risks. For example, what would a DEP designed to reduce attrition look like? What would a training program to increase the sensitivity of Drill Sergeants towards such recruits look like (assuming the Army wants to retain said recruits)? How would the Army deal with the potential stigmatization recruits might feel by being identified as high-risk (e.g., self-fulfilling prophecies from the recruits, Pygmalion effects set in motion by Drill Sergeants)? Note that although the data collected in this research were designed to address issues of identification (i.e., who attrits?) and understanding (i.e., why do they attrit?), they do not allow us to evaluate either (a) the strategies for *dealing with* recruits or Soldiers deemed to be high-risk or (b) the implications of implementing such strategies. Keenan, Strickland, Waugh, Hoenisch, and Schultz (2004) describe one approach for structuring interventions with Drill Sergeants that may have promise.

One note regarding Options 3 and 4 (i.e., the DEP options): The length of DEP often depends on factors such as (a) whether the recruit is in high school (e.g., if so, DEP lasts at least until graduation) or (b) when the recruit signs up (e.g., Soldiers who join near the end of the fiscal year might have a short DEP in order to access them within the current fiscal year and thus help make recruiters' goals). The Army does not require Soldiers to participate in DEP activities. Testimony during hearings by the Commission on Military Training and Gender-Related Issuesnoted that only the Marines required DEP recruits to participate in DEP activities, including physical fitness requirements (Dr. D. E. Becker, personal communication, March 15, 2004).[66] Implementation of mandatory DEP activities or assignment of extended DEP times would entail structural and procedural changes but might serve as an alternate useful way to front-load early attrition.[67]

Regarding the final option—identifying precursors of attrition—the various chapters in this report outlined the Project First Term variables most successful for predicting attrition of

[66] Participation in DEP activities did not predict attrition in the present research, although total time in DEP did.

[67] As noted in Chapter 4 and Appendix F, we viewed longer DEP times as indicative of a propensity to complete what one starts. Recruits who complete long DEP periods were at risk for attriting from the Army for a reasonable period of time but survived. The longer the Army extends DEP, the more chance it has to expose recruits to this trial risk for withdrawal prior to training.

different types at different times. In sections below, we focus on specific ways in which findings from the chapters could be used to manage IET and in-unit attrition.

Managing IET Attrition

For BCT and One-Station Unit Training (OSUT), the structural models we fitted indicated that few predictors have direct effects on attrition. Attrition cognitions proved to be the best predictor of attrition. This variable requires that we consider its antecedents, because it does not lend itself to pre-enlistment screening due to potential response distortion ("If you enlist in the Army, do you think you will honor your contract and complete your enlistment?"). Further, any interventions that would be applied in training might well be too late if new Soldiers have already been thinking about trying to leave. Rather, we believe it would be useful to try to influence those variables that predict the formation of such cognitions. As shown by the structural models in Chapters 4 (BCT) and 6 (OSUT), it is possible to work backwards from factors underlying attrition cognitions to a set of factors that can be (or are currently) assessed in the operational selection context. For example, the structural models of attrition revealed that positive affect toward the Army (e.g., affective commitment), generalized self efficacy, and perceived stress had strong direct effects on attrition cognitions. We also found that post-BCT attrition intentions could be predicted quite well by such factors (see Chapter 5).

Although these variables do not readily lend themselves to assessment in an operational selection context either (again, because of susceptibility to response distortion), factors underlying them do. For example, in addition to their direct effects on early attrition, pre-service physical fitness and medical history have direct effects on generalized self efficacy (and thereby indirect effects on attrition). Other factors that either directly impact attrition cognitions, or do so through generalized self efficacy or stress/strain, are either currently available prior to entry (e.g., AFQT scores) or might lend themselves to assessment prior to entry. For example, factors reflecting a propensity for "homesickness" and "reluctance to leave home" appear to underlie both attrition cognitions and stress/strain. Thus, "biodata-like" items capturing "attachment to home" (e.g., how long have you lived in your current home; how much have you traveled; how many times have you moved in your life)[68] that may indicate susceptibility to "homesickness" may help identify those at risk for attrition.

With regard to precursors of pre-training affective commitment to the Army, we hypothesize that recruits who have values, interests, and expectations that match what the Army actually provides first-term Soldiers would have higher levels of positive affect than those whose preferences and expectations do not match those of the Army. Unfortunately, with the exception of rated importance of core Army values, we were unable to identify likely *antecedents* of positive affect toward the Army.

An alternative explanation for the effect of core Army values is that they might simply reflect one small part of a more general set of factors that influence attrition and are generally more realistic to assess in an operational selection setting. Specifically, such variables may reflect one aspect of person-environment (P-E) fit. Unfortunately, the core Army values measure

[68] These are simply examples—we have no empirical data supporting their validity.

in the First Term surveys focuses on one small aspect of P-E fit, in terms of both content (focus on one type of values; not other work values, interests, or expectations) and polarity (focus on "fit" rather than "misfit"; i.e., the values the Army supplies, rather than values the recruit desires, yet the Army fails to support). For this reason, we could not properly evaluate the potential utility that pre-entry measures of fit have for identifying recruits at high risk for attrition.

After Attrition Cognitions, the predictor with the next strongest direct effect on BCT/OSUT attrition was Past Withdrawal Propensity. Unlike attrition cognitions, we believe past withdrawal propensity may lend itself to use in pre-entry screening. For example, although months in DEP would not be possible to include in a pre-entry measure, education tier and verifiable biodata items regarding reasons for withdrawing from past jobs or life activities (e.g., quitting an athletic team) might serve as promising indicators of this construct.

Lastly, based on the BCT/OSUT analyses it appears that some measure of emotional stability (or conversely, neuroticism) may be beneficial to include in an attrition risk assessment. For example, the total number of reasons offered for being uncertain about the Army and the number of reasons why one might leave during the next 6 months affected BCT/OSUT attrition indirectly through Attrition Cognitions (most notably through Stress/Strain). Arguably, these variables may be viewed as proxies for a lack of Emotional Stability. Furthermore, although not included in our structural model (due to sample size issues), AIM Adjustment (which reflects Emotional Stability) had one of the stronger bivariate relationships with attrition, and its correlation with Stress/Strain was -.35. Thus, we feel that an index of Emotional Stability designed to be robust to faking might be a useful addition to a pre-entry BCT/OSUT risk assessment.

It is important to remember that the variables we examined in this research are not all-inclusive of the factors that may best account for IET attrition. Although we presented data suggesting that pre-training attrition cognitions was the strongest predictor of IET attrition, past research suggests that the best predictors of attrition are attitudes and intentions assessed most proximally to the attrition event (Fishbein & Ajzen, 1975). Thus, we should expect that the best predictors of attrition during BCT and OSUT are the attitudes and intentions that are formed after Soldiers enter training yet before they attrit (as they were for AIT). Indeed, findings from the civilian turnover literature suggest that the strongest determinants of on-the-job withdrawal cognitions (in our case, in-service attrition cognitions) are satisfaction and commitment (Hom & Griffeth, 1995). Such findings suggest that augmenting an operational risk assessment with measures of needs-supplies fit and expectations-reality fit may make for a particularly powerful measure of a recruit's risk for IET attrition.

One caveat to this discussion, however, regards the difference between turnover in the civilian and military settings. As discussed in Chapter 4, the civilian models describe behavior for people with organizational experience, whereas the majority of Army recruits lack organizational experience. Further, turnover in the civilian literature is primarily a volitional event, whereas military attrition is not. This probably helps explain why satisfaction shows relatively little correlation with military attrition. Therefore, P-E fit—which primarily predicts satisfaction and attrition indirectly thereby—might have less impact than seen in the civilian literature.

In sum, for IET attrition, one possible risk assessment would target the following areas, all of which may be designed to resist response distortion:

- Past Withdrawal Propensity
- Past and Current Medical History
- Past and Current Physical Fitness
- AFQT Scores
- Propensity for Homesickness
- Emotional Stability
- Needs-Supplies Fit
- Expectations-Reality Fit[69,70]

Managing In-Unit Attrition

Because the bulk of in-unit attrition involves moral character, the variables that are (a) available prior to in-unit service and (b) predictive of in-unit attrition are those that assess deviant behavior (e.g., smoking prior to DEP, getting in trouble in high school, thoughts about quitting high school). Here, in particular, the possibility of a biodata screen comprising verifiable items addressing past deviant and withdrawal behavior appears quite promising. As discussed in Chapter 7, these variables demonstrated relatively strong predictive relations, with some even increasing slightly over time. Thus, we suggest supplementing the above list of elements to examine with verifiable information regarding delinquency and past withdrawal (for a selection screen) and with the other such items (even if unverifiable) identifying Soldiers who would benefit from post-enlistment interventions.

Of particular note, smoking prior to DEP demonstrated significant predictive relations with AIT attrition and three varieties of in-unit attrition (Overall, Moral Character, Pregnancy/Parenthood). The finding that recruits who smoked prior to enlistment are high attrition risks has been documented elsewhere. For example, Klesges, Haddock, Chang, Talcott, and Lando (2000) reported a study of approximately 29,000 U.S. Air Force recruits. In that study, the attrition rates for smokers and non-smokers were 19.4% and 11.8%, respectively. For the Army FY1999 cohort in-unit sample from the First Term project, the rates are 34.2% and 21.5% (Overall attrition) and 21.9% and 10.2% (Moral Character), respectively. Further, Tables 7.11 and 7.12 demonstrate that the odds ratios for this item rival those of Education Tier for Overall in-unit attrition (ranges of 1.33 – 1.86 for SRS 42, ranges of 1.38 – 1.99 for Education Tier).

[69] We are presently developing several faking-resistant measures of person-environment fit for ARI's Select21 project (Putka, Van Iddekinge, & Sager, 2003).

[70] The bulk of this discussion has centered on BCT/OSUT attrition. As shown in Chapter 5, the results for AIT attrition represent a microcosm of the BCT/OSUT results. In addition, the low rate of AIT attrition—it constitutes only 6% of all first-term attrition—indicate that there might be little benefit to focusing efforts there.

REENLISTMENT

In one way, reenlistment decisions more closely resemble civilian turnover than military attrition behavior does. The reason for this lies in the volitional nature of the event. Granted, the Army does bar some Soldiers from reenlisting. Nevertheless, those deemed eligible must decide either to continue their tour of duty or enter the civilian world. As expected, several variables that predict civilian turnover best also proved quite valuable in predicting reenlistment (e.g., continuance commitment and continuance intention; *change* in continuance commitment also contributed to prediction). Of these, continuance intention was determined by many factors, many of which the Army could directly influence. For example, job satisfaction had a direct effect on continuance intentions. Efforts to improve Soldiers' levels of satisfaction should lead to increased commitment and intention to continue their Army careers. In addition, the support that unit leaders show for a Soldier's reenlistment and the level of procedural justice that Soldiers perceive as operating both have strong positive relations with continuance intentions.

Identification of Soldiers who are more likely to reenlist could even be performed as early as entry to IET. As reported in Chapter 8, continuance intentions measured at the Reception Battalion still predicted reenlistment behavior occurring 4 years later. Further, the evidence that satisfaction was a significant predictor of continuance intentions suggests that reenlistment behavior would benefit from considering some of the person-environment fit selection measures discussed earlier in this chapter.

Even so, we believe the end of training to be a more reasonable time point during which to assess Soldiers' attitudes and administer targeted interventions aimed at increasing continuance intentions. Specifically, attempts to monitor and address issues regarding Soldier satisfaction, procedural justice, and organizational commitment should pay dividends in higher numbers of Soldiers who choose to remain for a second tour of duty, thereby allowing the Army to retain their knowledge and experience.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice Hall.

Barrick, M. R., & Mount, M. K. (1996). Effects of impression management and self-deception on the predictive validity of personality constructs. *Journal of Applied Psychology, 81*, 261-272.

Bateman, T. S., & Strasser, S. (1984). A longitudinal analysis of the antecedents of organizational commitment. *Academy of Management Journal, 27(1)*, 95-112.

Brose, G.D. (1999). *Could realistic job previews reduce first-term attrition?* Unpublished master's thesis. Monterey, CA: Naval Postgraduate School.

Campion, M. A. (1991). Meaning and measurement of turnover: Comparison of alternative measures and recommendations for research. *Journal of Applied Psychology, 76*, 199-212.

Cortina, J. M., Doherty, M. L., Schmitt, N., Kaufman, G., & Smith, R. G. (1992). The "Big Five" personality factors in the IPI and MMPI: Predictors of police performance. *Personnel Psychology, 45*, 119-140.

Cox, M. (2004). True grit: The Army's campaign to recruit those who have the warrior stuff. *Army Times*, February 16, 2004.

Department of Defense (1985, May). *Defense manpower quality* (Volumes I-III). Report to the House and Senate Committees on Armed Services. Washington, DC: Office of the Assistant Secretary of Defense (Manpower, Installations, and Logistics).

Edwards, J.R. & Bagozzi, R.P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods, 5*, 155-174.

Edwards, J.R., & Parry, M.E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal, 36*, 1577-1613.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA : Addison-Wesley.

Flyer, E.S. (1959). *Factors relating to discharge for unsuitability among 1956 airmen accessions to the Air Force* (WADC-TN-59-201). Lackland Air Force Base, TX : Personnel Research Laboratory.

General Accounting Office (1998). *Military attrition: Better data, coupled with policy changes could help the services reduce early separations.* Washington, D.C: Author.

Griffeth, R. W., Hom, P. W., & Gaertner, S. (2000). A meta-analysis of antecedents and correlates of employee turnover: Update, moderator tests, and research implications for the next millennium. *Journal of Management, 26*, 463-488.

Hanley, J. A., & McNeil, B. J. (1982). The meaning and use of the area under a Receiver Operating Characteristic (ROC) curve. *Radiology, 143*, 29-36.

Harrison, D. A., & Martocchio, J. J. (1998). Time for absenteeism: A 20-year review of origins, offshoots, and outcomes. *Journal of Management, 24(3)*, 305-350.

Hom, P. W., & Griffeth, R. W. (1995). *Employee turnover.* Cincinnati, OH: South-Western.

Hom, P.W., Caranikas-Walker, F., Prussia, G.E., & Griffeth, R.W. (1992). A meta-analytical structural equations analysis of a model of employee turnover. *Journal of Applied Psychology, 77*, 890-909.

Hosmer, D.W. & Lameshow, S. (2000). *Applied logistic regression, 2nd Edition.* New York: John Wiley and Sons, Inc.

Hu, L.T. & Bentler, P.M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Hunter, J.E. & Schmidt, F.L. (1990). *Methods of meta-analysis: Correcting for error and bias in research findings.* Newbury Park, CA: Sage.

Keenan, P.A., Strickland, W.J., Waugh, G.W., Hoenisch, A.C., & Schultz, S.R. (2004). *Reducing Attrition in Initial Entry Training: Drill Sergeant Interventions.* Alexandria, VA: Human Resources Research Organization.

Kemery, E.R., Dunlap, W.P., & Griffeth, R.W. (1988). Correction for variance restriction in point-biserial correlations. *Journal of Applied Psychology*, 73, 688-691.

Klesges, R.C., Haddock, C.K., Chang, C.F., Talcott, G.W., & Lando, H.A. (2000). The association of smoking and the cost of military training. *Tobacco Control, 9*, 0-4.

Knapp, D.J. (Ed.) (2003). *Select21 measure development progress report.* (HumRRO IR-03-74). Alexandria, VA: Human Resources Research Organization.

Knapp, D.J., Heggestad, E.D., & Young, M.C. (2004). *Understanding and improving the Assessment of Individual Motivation (AIM) in the Army's GED Plus Program* (Study Note 2004-03). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Laurence, J.H. (1993). Education standards and military selection: From the beginning. In T. Trent & J.H. Laurence (Eds.), *Adaptability screening for the Armed Forces* (pp. 1-40). Washington, DC: Office of the Assistant Secretary of Defense.

Laurence, J. H., Naughton, J., & Harris, D. A. (1996). *Attrition revisited: Identifying the problem and its solutions* (Research Note 96-20). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Lee, E.T. & Mitchell, T.R. (1994). An alternative approach: The unfolding model of voluntary employee turnover. *Academy of Management Review, 19,* 51-89.

March, J.G. & Simon, H.A. (1958). *Organizations*. New York: John Wiley.

Marsh, H.W., & Hocevar, D. (1988). A new, more powerful approach to multitrait-multimethod analyses: Application of second-order confirmatory factor analysis. *Journal of Applied Psychology, 73,* 107-117

Mathieu, J.E. & Zajac, D. (1990). A review and meta-analysis of the antecedents, correlates and consequences of organizational commitment. *Psychological Bulletin, 108,* 171-194.

McCloskey, M.A. (1999). *An analysis of the effects of deployment on turnover in the United States Army reserve.* Unpublished masters thesis. Monterey, CA: Naval Postgraduate School.

McCloy, R.A., & DiFazio, A.S. (1994). Prediction of first-term military attrition using pre-enlistment predictors. In J.P. Campbell & L.M. Zook (Eds.), *Building and retaining the career force: New procedures for accessing and assigning Army enlisted personnel* (ARI Research Note) (pp. 169-214). Alexandria, VA: Human Resources Research Organization.

McCloy, R.A., Harris, D.A., Barnes, J.D., Hogan, P.F., Smith, D.A., Clifton, D., & Sola, M. (1992). *Accession quality, job performance, and cost: A cost-performance tradeoff model* (FR-PRD-92-11). Alexandria, VA: Human Resources Research Organization.

Muthen, L.K. & Muthen, B.O. (2001). *Mplus user's guide. 2nd Edition.* Los Angeles: Muthen & Muthen.

Nunnally, J. C. (1978). *Psychometric theory*. McGraw-Hill.

Owens, W.A. (1976). Background data. In M.D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 609-644). New York: John Wiley and Sons.

Putka, D.J., & McCloy, R.A. (2004). Preliminary AIM validation based on GED Plus program data. In D.J. Knapp, E.D. Heggestad, & M.C. Young (Eds.), *Understanding and improving the Assessment of individual motivation (AIM) in the Army's GED Plus program* (Study Note 2004-03) (pp. 3-1—3-11. Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Putka, D.J., & McCloy, R.A. (2001, October). *A primer on signal detection theory: Applications to the prediction of attrition in the U.S. Army.* Presentation to the U. S. Army Research Institute for the Behavioral and Social Sciences at the Human Resource Research Organization, Alexandria, VA, October 4, 2001.

Putka, D.J, Noble, C.L., Becker, D.E., & Ramsberger, P.F. (2004). *Evaluating moral character waiver policy against Servicemember attrition and in-service deviance through the first 18 months of service* (HumRRO FR-03-96). Alexandria, VA: Human Resources Research Organization.

Putka, D.J. & Strickland, W.J. (2004). *A Comparison of the FY03 and FY99 First Term Attrition Study Cohorts* (FR-04-35). Alexandria, VA: Human Resources Research Organization.

Putka, D.J., Van Iddekinge, C.H., & Sager, C.E. (2003, October). Developing measures of occupational interests and values for selection. In M.G. Rumsey (Chair), *Occupational Interest Measurement: Where Are the Services Headed?*. Symposium conducted at the 2003 International Military Testing Association.

Salgado, J. (2002). The big five personality dimensions and counterproductive behaviors. *International Journal of Selection and Assessment, 10*, 117-125.

Schaubroeck, J., Lam, S. K., & Xie, J. L. (2000). Collective efficacy versus self efficacy in coping responses to stressors and control: A cross-cultural study. *Journal of Applied Psychology, 85*, 512-52.

Singer, J.D. & Willett, J.B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence.* Oxford: Oxford University Press.

Sipes, D. E., & Sadacca, R. (2000). *Initial data collection and preliminary analyses for research on first-term Soldier attrition and management (Project First Term)* (ARI Research Note 2000-10). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Sipes, D. E., & Strickland, W. J. (2002). *Factors influencing the continuance intentions of initial entry training graduates.* Alexandria, VA: Human Resources Research Organization.

Sipes, D. E., Strickland, W. J., Laurence, J. H., DiFazio, A. S., & Wetzel, E. S. (2000). *Training base attrition: Analyses and findings.* Alexandria, VA: Human Resources Research Organization.

Sipes, D. E., Strickland, W. J., & Sun, S. (2002). *Attrition and career intentions among the Army's FY99 entry cohort.* Alexandria, VA: Human Resources Research Organization.

Steers, R.M. & Mowday, R.T. (1981). Employee turnover and postdecision accommodation processes. In L. Cummings and B. Staw (Eds.), *Research in Organizational Behavior, 3* (pp. 235-281). Greenwich, CT: JAI Press.

Strickland, W. J., & Tremble, T. R., Jr. (1999). *Designing and planning a comprehensive investigation of enlisted attrition across the first-term cycle* (FR-WATSD-99-52). Alexandria, VA: Human Resources Research Organization.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston: Allyn and Bacon.

Trent, T. & Laurence, J.H. (Eds.) (1993). *Adaptability screening for the Armed Forces.* Washington D.C.: Office of the Assistant Secretary of Defense (Force Management and Personnel).

Van Iddekinge, C. H., & Strickland, W. J., (2003). *Workforce attrition and retention in the military.* Alexandria, VA: Human Resources Research Organization.

Van Iddekinge, C. H., Strickland, W. J., & Sipes, D. E. (2003a). *Career intentions among the Army's FY99 entry cohort after three years of service.* Alexandria, VA: Human Resources Research Organization.

Van Iddekinge, C. H., Strickland, W. J., & Sipes, D. E. (2003b). *Predicting unit attrition among the Army's FY 1999 entry cohort.* Alexandria, VA: Human Resources Research Organization.

Williams, L.J., & Hazer, J.T. (1986). Antecedents and consequences of satisfaction and commitment in turnover models: A reanalysis using latent variable structural equation methods. *Journal of Applied Psychology, 71*, 219-231.

Wolfe, S. L., Nordstrom, C. R., & Williams, K. B. (1998). The effect of enhancing self efficacy prior to job training. *Journal of Social Behavior and Personality, 13*, 633-650.

Zellars, K. L., Hochwarter, W. A., Perrewe, P. L., Miles, A. K., & Kiewitz, C. (2001). Beyond self efficacy: Interactive effects of role conflict and perceived collective efficacy. *Journal of Managerial Issues, 13*, 483-499.

Zickar, M. J. (2000). Modeling faking on personality tests. In D. Ilgen & C. L. Hulin (Eds.), *Computational modeling of behavioral processes in organizations* (pp. 95-108). Washington, DC: American Psychological Association.

APPENDIX A: FIRST TERM SURVEYS AND ADMINISTRATIVE VARIABLES EXAMINED IN THIS REPORT

This appendix provides copies of the first term surveys and a listing of administrative (DMDC/EMF) variables examined in this report. Table A.1 shows the administrative variables examined. The pages that follow display the surveys.

Table A.1. Administrative Variables Examined

AFQT Category at Entry
AFQT Score at Entry
Career Management Field (CMF) Category
Centers for Disease Control (CDC) Body Mass Index (BMI) Category
Education Tier at Entry
Enlistment Bonus Option
Enlistment Term at Entry
Enlistment Waiver
High Quality Recruit Designation (High School Diploma Graduate + AFQT Cat I-IIIA)
Marital Status at Entry (Single v. Married)
Medical Failure: Cardiovascular (Lungs, Heart, Vascular, BP, EKG, Pulse)
Medical Failure: Drugs
Medical Failure: Other
Medical Failure: Physical Extremities (Upper, Lower, Feet, Spine)
Medical Failure: Weight
Medical/Physical Enlistment Waiver
Moral Character Enlistment Waiver
MOS
MOS Classification (Combat Arms, Combat Support, Combat Service Support)
Number of Dependents at Entry
Pay Grade at Entry
Race/Ethnicity (White, Black, Hispanic, Other)
Gender
Youth Program Participation

SOLDIER RECEPTION SURVEY

SURVEY APPROVAL AUTHORITY: U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
SURVEY CONTROL NUMBER: PT 60-18A

The **Soldier Reception Survey** is part of a research project to evaluate the attitudes and experiences of enlisted personnel during their careers in the United States Army. In this project, the U.S. Army Research Institute (ARI) will assess the expectations and impressions of new recruits, soldiers completing training, and personnel exiting the Army. The project covers a wide range of issues related to soldiers' jobs, careers, and the Army as a whole. The overall purpose is to provide senior Army leaders information for recruiting, training, and retaining a high quality force of soliders.

Thank you for your support for this survey program.

PRIVACY ACT STATEMENT

1. The Department of the Army may collect the information requested in this survey under the authority of 10 United States Code 2358. Providing information in this questionnaire is voluntary. Failure to respond to any specific question will not result in any penalty.

2. Public Law 93-573 (Privacy Act of 1974) requires that you be informed of the purpose and uses to be made of the information collected. The information collected in the survey will be used solely for research purposes. Your Social Security Number (SSN) is requested only for linking data files. Use of SSNs is authorized by Executive Order 9397. In accordance with federal regulations, the survey data will be safeguarded to protect your privacy. After we have used your SSN to create the data files, a new identification code will be created to replace your SSN. The file linking your SSN to the new ID code will be properly secured to preserve confidentiality. Only survey statisticians involved in collecting or preparing the information for analysis will have access to completed questionnaires. Only group statistics will be reported.

How to fill out this survey.

Read each question carefully and mark your answers directly on this form.

MARKING INSTRUCTIONS

- **Please use a No. 2 pencil.**
- **Please completely fill in the response as shown in the examples:**

Some questions ask you to mark ONLY ONE answer.

What component of the Army did you join? Mark the option that best describes you.

- ● Active Army
- ○ Reserve
- ○ National Guard

Other questions ask you to mark MORE THAN ONE answer.

Which of the following strongly influenced you to join the Army? MARK ALL THAT APPLY.

- ○ Parent(s)/Guardian(s)
- ● Friend(s)
- ○ Wife/Husband/Girlfriend/Boyfriend
- ● Athletic Coach
- ● Teacher

1. **Listed below are some reasons why people join the Army. How important was each of these reasons in your decision to join the Army?**

	Extremely important	Very important	Moderately important	Slightly important	Not at all important
a. Army advertising	1	2	3	4	5
b. Army recruiter	1	2	3	4	5
c. Desire to serve my country	1	2	3	4	5
d. Develop self-discipline	1	2	3	4	5
e. Earn more money than previous job(s)	1	2	3	4	5
f. Educational benefits	1	2	3	4	5
g. Family social support services	1	2	3	4	5
h. Get away from a personal problem	1	2	3	4	5
i. Influence of family	1	2	3	4	5
j. Influence of friends	1	2	3	4	5
k. Lack of civilian job opportunities	1	2	3	4	5
l. Medical care, coverage and benefits	1	2	3	4	5
m. Military tradition in family	1	2	3	4	5
n. Need to be on my own	1	2	3	4	5
o. Pay and allowances	1	2	3	4	5
p. Security and stability of a job	1	2	3	4	5
q. Training in job skills	1	2	3	4	5
r. Chance to travel	1	2	3	4	5
s. Repayment of loans	1	2	3	4	5
t. Prove that I could do it	1	2	3	4	5
u. Make Army a career	1	2	3	4	5
v. Become more mature	1	2	3	4	5
w. Take time out to decide about my life plans	1	2	3	4	5
x. Gain job experience	1	2	3	4	5
y. Escape from a bad neighborhood	1	2	3	4	5
z. Needed a place to live	1	2	3	4	5
aa. Chance for adventure	1	2	3	4	5

2. **Which of the following strongly influenced you to join the Army? MARK ALL THAT APPLY.**
   - ○ Parent(s)/Guardian(s)
   - ○ Brother/Sister
   - ○ Friend(s)
   - ○ Wife/Husband/Girlfriend/Boyfriend
   - ○ Athletic Coach
   - ○ Teacher
   - ○ School Guidance Counselor
   - ○ ROTC student
   - ○ ROTC cadre member
   - ○ Service member
   - ○ Recruiter
   - ○ Radio advertisement
   - ○ Television advertisement
   - ○ Printed advertisement

3. **What component of the Army did you join? Mark that option that best describes you.**
   - ○ Active Army
   - ○ Reserve
   - ○ National Guard

4. **How familiar are you with what will be expected of you in the Army?**
   - ○ Extremely familiar
   - ○ Very familiar
   - ○ Moderately familiar
   - ○ A little familiar
   - ○ Not at all familiar

5. **How long did you participate in the Delayed Entry Program (DEP)?**
   - ○ Less than 1 month
   - ○ 1 month
   - ○ 2 months
   - ○ 3 months
   - ○ 4 months
   - ○ 5 months
   - ○ 6 months
   - ○ 7 months
   - ○ 8 months
   - ○ 9 months
   - ○ 10 months
   - ○ 11 months
   - ○ 12 months

6. **How often did your recruiter hold DEP activities?**
   - ○ More than once a month
   - ○ About once a month
   - ○ Less than once a month
   - ○ Never
   - ○ Don't know

7. **How often did you attend DEP activities?**
   - ○ More than once a month
   - ○ About once a month
   - ○ Less than once a month
   - ○ Never (Why not? Please list below)

   _____

8. **In which of the following activities did you participate while in the DEP? MARK ALL THAT APPLY.**
   - ○ None
   - ○ Social functions with other people in the DEP
   - ○ Films, speakers, or question and answer sessions to get more information about Army
   - ○ Training sessions; for example, drill and ceremonies or first aid training
   - ○ Field trips to Army posts
   - ○ Physical training/exercise sessions
   - ○ Other types of DEP activities (please list below)

   _____

9. **How important is each of the following TO YOU PERSONALLY?**

	Extremely important	Very important	Quite important	Moderately important	Somewhat important	Slightly important	Not at all important
a. Loyalty to the United States Army	①	②	③	④	⑤	⑥	⑦
b. Taking responsibility for your actions and decisions	①	②	③	④	⑤	⑥	⑦
c. Putting what is good for others above your own welfare	①	②	③	④	⑤	⑥	⑦
d. Dedication to serving the United States, even to risking your life in its defense	①	②	③	④	⑤	⑥	⑦
e. Commitment to working as a member of a team	①	②	③	④	⑤	⑥	⑦
f. Dedication to learning your job and doing it well	①	②	③	④	⑤	⑥	⑦
g. Personal drive to succeed in your work and advance	①	②	③	④	⑤	⑥	⑦
h. Being honest, open and truthful	①	②	③	④	⑤	⑥	⑦
i. Being courageous	①	②	③	④	⑤	⑥	⑦
j. Standing up for what you firmly believe is right	①	②	③	④	⑤	⑥	⑦
k. Working with others tactfully	①	②	③	④	⑤	⑥	⑦
l. Exhibiting excellent appearance	①	②	③	④	⑤	⑥	⑦
m. High moral standards	①	②	③	④	⑤	⑥	⑦
n. Building and maintaining physical fitness and stamina	①	②	③	④	⑤	⑥	⑦

BACKGROUND INFORMATION

10. **In what year were you born?**

19 ☐☐

	⓪
	①
	②
	③
	④
⑤	⑤
⑥	⑥
⑦	⑦
⑧	⑧
⑨	⑨

11. **When you were growing up, did you have a parent/guardian who was career active duty military?**
○ Yes ○ No

12. **Are you:**
○ Male ○ Female

13. **How many dependent children do you have (for whom you provide financial support)?**
○ None ○ 1 ○ 2 ○ 3 ○ 4 or more

14. **Are you of Hispanic/Spanish origin or ancestry (of any race)?**
○ No
○ Yes, Mexican, Mexican-American, Chicano
○ Yes, Puerto Rican
○ Yes, other Hispanic/Spanish

15. **What is your racial background?**
○ American Indian, Eskimo or Aleut
○ Asian or Pacific Islander
○ Black
○ White

ABOUT YOUR EDUCATION

16. **Fill in the circles for each grade you finished. It's OK to choose more than one type of school. Fill a circle for EACH grade you finished.**

	PUBLIC school	PRIVATE school	Classes mostly at HOME	GED equivalency
Grade 1	○	○	○	○
Grade 2	○	○	○	○
Grade 3	○	○	○	○
Grade 4	○	○	○	○
Grade 5	○	○	○	○
Grade 6	○	○	○	○
Grade 7	○	○	○	○
Grade 8	○	○	○	○
Grade 9	○	○	○	○
Grade 10	○	○	○	○
Grade 11	○	○	○	○
Grade 12	○	○	○	○

IMPORTANT: Make sure you filled a circle above for EVERY GRADE you finished.

17. **Did you finish high school?**
○ No ○ Yes. If yes, choose the credential(s) you earned when you finished high school. **Fill in at least one circle:**
- ○ Diploma – earned from a public or private **traditional day school**
- ○ Diploma – earned from an **adult (continuation)** school
- ○ Diploma – issued by parents or tutors for **home schooling**
- ○ Diploma – issued by an association, school, or state for **home schooling**
- ○ Diploma – issued by a **vocational** or **technical** school
- ○ Diploma – issued by a **correspondence** school
- ○ GED **equivalency** diploma
- ○ Certificate – for high **school attendance or completion**

18. **Did you finish one semester/quarter of college (at least 4 courses)? Do not include advanced placement courses you took in high school.**
- ○ No
- ○ Yes. If yes, fill in your highest level:
  - ○ One or more semesters/quarters of college
  - ○ One or more semesters/quarters of vocational college
  - ○ An associate degree
  - ○ A bachelor's or higher degree

19. **Did you participate in the National Guard ChalleNGe program?**
- ○ No
- ○ Yes. If yes, did you graduate from ChalleNGe?
  - ○ No
  - ○ Yes

20. **What was your average grade during the time you were in high school?**
- ○ A or A-
- ○ B+ or B
- ○ B- or C+
- ○ C or C-
- ○ D or lower

21. **Are you planning to go to college?**
- ○ Yes, while on active duty during this enlistment
- ○ Yes, after I complete this term of active duty
- ○ No
- ○ Undecided

22. **Did you ever get into trouble at school for doing any of the things below? Mark all things for which you were sent to the principal's office. MARK ALL THAT APPLY.**
- ○ I was never sent to the principal's office
- ○ Missing class
- ○ Skipping school
- ○ Fighting
- ○ Being disorderly
- ○ Bad language
- ○ Smoking
- ○ Talking back to teachers
- ○ Other reasons

23. **Were you ever expelled from high school or junior high (intermediate school)?**
- ○ Yes
- ○ No

24. **Were you ever suspended from high school or junior high (intermediate school)?**
- ○ Yes
- ○ No

25. **If you ever thought about quitting high school, show why. MARK ALL THAT APPLY.**
- ○ I never thought about quitting high school
- ○ My family needed money or needed me at home
- ○ I was expelled or suspended
- ○ I was bored, wasn't learning anything useful
- ○ I got married or became a parent
- ○ I was getting bad grades
- ○ I didn't get along with the other students
- ○ The rules were too strict
- ○ I wasn't going to graduate on time
- ○ I didn't get along with the teachers, counselors, or the principal
- ○ I wanted to work full time
- ○ Other reasons

26. **During high school, did you participate in any of the following activities? MARK ONE RESPONSE FOR EACH ACTIVITY.**

	Participated as a Leader or Officer	Participated	Did Not Participate
a. Athletic teams	○	○	○
b. Drama, music, art, chorus	○	○	○
c. School clubs	○	○	○
d. Other clubs (Scouts, "Y", 4-H, etc.)	○	○	○

27. **During your high school years, what size city or area did you live in?**
- ○ Large city (over 300,000 people)
- ○ Suburb of a large city
- ○ Medium-sized city (50,000-300,000)
- ○ Small city or town (under 50,000)
- ○ Rural area

28. **What is your current marital status?**
- ○ Married
- ○ Legally separated or filing for divorce
- ○ Single, never married
- ○ Single, engaged to be married
- ○ Divorced
- ○ Widowed

29. **Is there an important girlfriend/boyfriend in your life right now?**
- ○ Does not apply; I am currently married
- ○ Yes
- ○ No

30. **Is your spouse/girlfriend/boyfriend currently working in a civilian job (including a job with the U.S. Army/Department of Defense)? MARK ONE.**
- ○ Does not apply; I do not have a spouse/girlfriend/boyfriend
- ○ Does not apply; my spouse/girlfriend/boyfriend is on active duty
- ○ Yes, full-time
- ○ Yes, part-time
- ○ No, but is currently looking for work
- ○ No, not looking for work but would like to work
- ○ No, does not want to work now

31. **How supportive is your spouse/girlfriend/boyfriend of your making a career of the Army?**
- ○ Does not apply; I do not have a spouse/girlfriend/boyfriend
- ○ Very supportive
- ○ Fairly supportive
- ○ Mixed or neutral
- ○ Fairly unsupportive
- ○ Very unsupportive

32. **When your spouse/girlfriend/boyfriend was growing up, did he/she have a parent/guardian who was career active duty military?**
- ○ Does not apply; I do not have a spouse/girlfriend/boyfriend
- ○ Yes
- ○ No
- ○ Don't know

33. **Is your spouse/girlfriend currently pregnant?**
- ○ Does not apply; I do not have a female spouse/girlfriend
- ○ Yes
- ○ No, but plans to be within one year
- ○ No, but maybe in the future
- ○ No, and does not plan to be
- ○ Don't know

34. **During the last 12 months, have you (or your spouse/girlfriend) given birth to a child?**
- ○ Does not apply
- ○ Yes
- ○ No

35. **During the two years before entering the Army, what was your average level of fitness?**
- ○ Very high
- ○ High
- ○ Moderate
- ○ Low
- ○ Very low

36. **During the two years before entering the Army, how many fairly serious physical injuries did you receive?**
- ○ None
- ○ 1-2
- ○ 3-5
- ○ 6-9
- ○ 10 or more

37. **During the two years before entering the Army, were you ever advised by a medical practitioner not to participate in any exercise or sport programs?**
- ○ Yes
- ○ No

38. **Have you ever left a job for any of the following reasons? MARK ALL THAT APPLY.**
- ○ I haven't had a job outside the home
- ○ I went back to school
- ○ The pay was not good
- ○ I was laid off
- ○ I was fired
- ○ I found a better job
- ○ I moved to another location
- ○ I didn't get along with my supervisor
- ○ I was arrested
- ○ There was no chance to get ahead
- ○ The working conditions were bad (dangerous, hot, dusty, etc.)
- ○ To join the military
- ○ Other reasons

39. **Did you need to get a moral waiver in order to be accepted by the Army?**
- ○ Yes
- ○ No

40. **Did you need to get a medical waiver in order to be accepted by the Army?**
- ○ Yes
- ○ No

41. **What is the length of your enlistment term?**
- ○ 2 years
- ○ 3 years
- ○ 4 years
- ○ More than 4 years

42. **During the last 6 months before entering the DEP, how often did you smoke cigarettes?**
- ○ Never
- ○ Rarely
- ○ Once a week or so
- ○ 2-3 times a week
- ○ 4-5 times a week
- ○ Daily

43. **During the last 6 months before entering the DEP, how often did you drink alcoholic beverages?**
- ○ Never
- ○ Rarely
- ○ Once a week or so
- ○ 2-3 times a week
- ○ 4-5 times a week
- ○ Daily

44. How strongly do you agree or disagree with the following statements about your military life? MARK A RESPONSE FOR EACH.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a. The Army has a great deal of personal meaning to me	1	2	3	4	5
b. It would be too costly for me to leave the Army in the near future	1	2	3	4	5
c. I am afraid of what might happen if I quit the Army without having another job lined up	1	2	3	4	5
d. Too much in my life would be disrupted if I decided I wanted to leave the Army now	1	2	3	4	5
e. I feel a strong sense of belonging to the Army	1	2	3	4	5
f. I feel "emotionally attached" to the Army	1	2	3	4	5
g. One of the problems of leaving the Army would be the lack of good alternatives	1	2	3	4	5

45. From what you know and have heard about the Army and civilian life, please indicate how you believe conditions in the military are compared with conditions in a civilian job you could realistically expect to get. MARK A RESPONSE FOR EACH.

	Much Better in Army	Somewhat Better in Army	About the Same	Somewhat Better in Civilian Life	Much Better in Civilian Life	Don't Know
a. Pay	1	2	3	4	5	6
b. Retirement benefits	1	2	3	4	5	6
c. Benefits other than retirement	1	2	3	4	5	6
d. Assistance for civilian education	1	2	3	4	5	6
e. Opportunities to advance in your chosen field	1	2	3	4	5	6
f. Opportunities for job satisfaction	1	2	3	4	5	6
g. Quality of co-workers	1	2	3	4	5	6
h. Working hours/schedule	1	2	3	4	5	6
i. Time for personal/family life	1	2	3	4	5	6
j. Overall quality of life	1	2	3	4	5	6
k. Level of professionalism in the organization	1	2	3	4	5	6
l. Personal freedom	1	2	3	4	5	6
m. Job security	1	2	3	4	5	6
n. Total family income	1	2	3	4	5	6

46. How confident are you that you will: MARK A RESPONSE FOR EACH.

	Extremely Confident	Very Confident	Moderately Confident	Slightly Confident	Not Confident At All
a. Adapt to Army life	1	2	3	4	5
b. Complete your term of obligation	1	2	3	4	5
c. Meet the Army's physical requirements	1	2	3	4	5
d. Be successful in basic training	1	2	3	4	5
e. Earn promotions in the Army	1	2	3	4	5

47. The kind of work I enjoy most is available:

- ○ only in the military.
- ○ primarily in the military.
- ○ equally in the military and civilian world.
- ○ primarily in the civilian world.
- ○ only in the civilian world.

48. Considering both your own qualifications and current labor market conditions, how difficult do you think it would be for you to find a good civilian job right now?

- ○ Very difficult
- ○ Difficult
- ○ Not particularly difficult or easy
- ○ Easy
- ○ Very easy

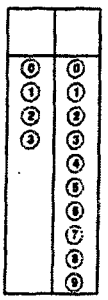
49. My personal or family situation would make it difficult for me to leave the Army in the next year or so.

- ○ Strongly agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

50. Which ONE of the following best describes your current Army career intentions? MARK ONE.

- ○ PROBABLY stay in until retirement
- ○ DEFINITELY stay in until retirement
- ○ PROBABLY stay in beyond my present obligation, but not necessarily to retirement
- ○ DEFINITELY stay in beyond my present obligation, but not necessarily to retirement
- ○ PROBABLY leave upon completion of my present obligation
- ○ DEFINITELY leave upon completion of my present obligation

51. **How many years of active duty service do you expect to have completed by the time you leave the Army? (Zero if no active duty)**



52. **A male friend who you think is qualified asks your advice about joining the Army. Would you recommend that he ... (MARK ONE)**
- ○ join the Army?
- ○ join another military service?
- ○ not join a military service?

53. **A female friend who you think is qualified asks your advice about joining the Army. Would you recommend that she ... (MARK ONE)**
- ○ join the Army?
- ○ join another military service?
- ○ not join a military service?

54. **Do any of the following cause you to be unsure about an Army career? MARK ALL THAT APPLY.**
- ○ My lack of experience in the Army
- ○ My career goals are unclear
- ○ Unsure of chances for promotion
- ○ Changes in Army job opportunities
- ○ Changes in the Army mission
- ○ Possibility of being subjected to sexual or racial discrimination
- ○ None of the above

55. **How has your commitment to an Army career changed since you signed your Army contract?**
- ○ Much greater now
- ○ Somewhat greater now
- ○ About the same as it was when I signed
- ○ Somewhat less now
- ○ Much less now

56. **At the present time, how do you feel about your decision to enlist in the Army?**
- ○ Definitely made the right decision
- ○ Probably made the right decision
- ○ Not sure
- ○ Probably made the wrong decision
- ○ Definitely made the wrong decision

57. **Assume you were to leave the Army in the next six months. Which of the following reasons for leaving would likely apply in your case? RESPOND TO EACH ITEM.**

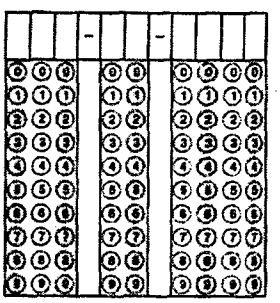
	Not Likely to Apply	Likely to Apply
a. Failure to meet physical requirements	○	○
b. Problems adjusting to Army life	○	○
c. Family problems at home	○	○
d. Pregnancy	○	○
e. Disciplinary problems; minor offense	○	○
f. Poor academic performance	○	○
g. Illness/medical condition	○	○
h. Homesickness	○	○
i. Lack of motivation; boredom	○	○
j. Problems with supervisors	○	○
k. Racial discrimination	○	○
l. Sexual or gender discrimination	○	○
m. Better job opportunities outside the Army	○	○
n. Injuries sustained during training	○	○
o. Not getting desired military job	○	○
p. Sexual harassment	○	○
q. One or more serious offenses	○	○
r. Not getting along with others	○	○

58. **At the present time, what level of strain, conflict or stress – if any – are you experiencing about your stay in the Army?**
- ○ Very high ○ Low
- ○ High ○ Very low
- ○ Moderate ○ None

59. **How would you rate your current level of morale?**
- ○ Very high ○ Low
- ○ High ○ Very low
- ○ Moderate

60. **Have you participated in Values Training since entering the Army?**
- ○ Yes ○ No

61. **Enter your Social Security Number below.**



R14660-PFI-54221

SOLDIER END-OF-TRAINING SURVEY

SURVEY APPROVAL AUTHORITY: U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
SURVEY CONTROL NUMBER: PT 60-18C

The **Soldier End-of-Training Survey** is part of a research project to evaluate the attitudes and experiences of enlisted personnel during their careers in the United States Army. The U.S. Army Research Institute (ARI) will assess the expectations and impressions of new recruits as well as enlisted personnel who have recently completed training and personnel exiting the Army. The project covers a wide range of issues related to soldiers' jobs, careers, and the Army as a whole. The overall purpose is to provide senior Army leaders information for recruiting, training, and retaining a high quality force of soliders.

Thank you for your support for this survey program.

PRIVACY ACT STATEMENT

1. The Department of the Army may collect the information requested in this survey under the authority of 10 United States Code 2358. Providing information in this questionnaire is voluntary. Failure to respond to any specific question will not result in any penalty.

2. Public Law 93-573 (Privacy Act of 1974) requires that you be informed of the purpose and uses to be made of the information collected. The information collected in the survey will be used solely for research purposes. Your Social Security Number (SSN) is requested only for linking data files. Use of SSNs is authorized by Executive Order 9397. In accordance with federal regulations, the survey data will be safeguarded to protect your privacy. After we have used your SSN to create the data files, a new identification code will be created to replace your SSN. The file linking your SSN to the new ID code will be properly secured to preserve confidentiality. Only survey statisticians involved in collecting or preparing the information for analysis will have access to completed questionnaires. Only group statistics will be reported.

How to fill out this survey.

Read each question carefully, and mark your answers directly on this form.

MARKING INSTRUCTIONS

- **Please use a No. 2 pencil.**
- **Please completely fill in the response as shown in the examples:** CORRECT ● INCORRECT ✓ ✗ ◐ ●

Some questions ask you to mark ONLY ONE answer.

What stage of training are you currently completing? MARK ONE.

- ● Basic Training (BT)
- ○ Advanced Individual Training (AIT)
- ○ One Station Unit Training (OSUT)

Other questions ask you to mark MORE THAN ONE answer.

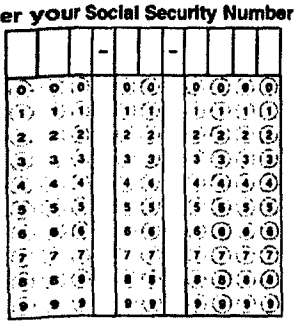
Since you joined the Army, was the most severe punishment for the same type of offense usually given to: MARK ALL THAT APPLY.

- ○ Does not apply; all are treated the same
- ● Men
- ○ Women
- ● Whites
- ● Blacks
- ○ Hispanics
- ○ Some other race/ethnic group (PLEASE LIST)

What component of the Army did you join? Mark the option that best describes you.

- Active Army
- Reserve
- National Guard

2. Enter your Social Security Number below.



3. What stage of training are you currently completing? MARK ONE.

- Basic Combat Training (BCT)
- Advanced Individual Training (AIT)
- One Station Unit Training (OSUT)

4. How satisfied are you with the training you have received since you entered the Army?

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Dissatisfied
- Very dissatisfied

5. How realistic were the expectations you had about Army life before you joined the Army?

- Very realistic
- Mostly realistic
- Mostly unrealistic
- Very unrealistic

6. Have you participated in Values Training since entering the Army?

- Yes
- No

7. How has Army life compared with your expectations before you joined the Army?

- Much better than I expected
- Somewhat better than I expected
- About the same as I expected
- Somewhat worse than I expected
- Much worse than I expected

8. To what extent has your most recent training.... MARK A RESPONSE FOR EACH.

	Very great extent	Great extent	Moderate extent	Slight extent	Not at all	No basis to judge
a. contributed toward your professional development?	1	2	3	4	5	6
b. instilled Army values?	1	2	3	4	5	6
c. prepared you to perform your Army duties?	1	2	3	4	5	6
d. prepared you for your future Army assignments?	1	2	3	4	5	6

9. How has your commitment to an Army career changed during this training?

- Much greater now
- Somewhat greater now
- About the same as it was when I started training
- Somewhat less now
- Much less now

10. What effect, if any, have your Army experiences had on the development of <u>specific job knowledge, skills, and abilities</u> that will help you perform a civilian job?

- Extremely positive effect
- Very positive effect
- Little effect
- No effect
- Don't know

11. What effect, if any, have your Army experiences had on the development of <u>personal characteristics and attitudes</u> that will help you perform a civilian job?

- Strong positive effect
- Postive effect
- No effect
- Negative effect
- Strong negative effect
- No basis to judge

12. How does your physical health compare now to what it was when you first entered the Army?

- Much better now
- Somewhat better now
- About the same as it was
- Somewhat worse now
- Much worse now

13. During your recent training, did you have any medical problems/injuries for which you visited a Doctor or the Troop Medical Command (TMC)?

- Yes
- No

14. Before you enlisted, were you ever advised by a medical practitioner not to participate in any physical exercise or sports program because of a problem/injury similar to the one you had during your recent training?

- Yes
- No
- Does not apply; I had no medical problem/ injury during training

15 **Please indicate your level of agreement with the following statements. MARK A RESPONSE FOR EACH.**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The Army will allow me to maintain the standard of living I want for myself/my family	①	②	③	④	⑤
b. The Army will allow me to maintain the kind of balance I want between my work and personal life	①	②	③	④	⑤
c. Even if I had an offer of a bit more pay from a civilian organization, I would be reluctant to leave the Army	①	②	③	④	⑤
d. I would discourage a close friend from joining the Army	①	②	③	④	⑤
e. The demands of the Army make it difficult to have the kind of family life I would like	①	②	③	④	⑤
f. I can count on Army people to help out when needed	①	②	③	④	⑤
g. I frequently feel like leaving the Army	①	②	③	④	⑤
h. I am quite proud to tell people that I am in the Army	①	②	③	④	⑤
i. For me, a rewarding career can compensate for limited personal/family time	①	②	③	④	⑤
j. I can get ahead in the Army doing the kinds of work I like best	①	②	③	④	⑤
k. The Army has a great deal of positive meaning to me	①	②	③	④	⑤
l. I feel a strong sense of belonging to the Army	①	②	③	④	⑤
m. I feel "emotionally attached" to the Army	①	②	③	④	⑤
n. One of the problems of leaving the Army would be the lack of good alternatives	①	②	③	④	⑤

16. Since arriving at your present Army post, did you get into any serious trouble (UCMJ offenses)?

- ○ No
- ○ Yes, just once
- ○ Yes, two or three times
- ○ Yes, four or more times

17. Since arriving at your present Army post, have YOU been sexually harassed? MARK ONE.

- ○ No → GO TO Q. 21
- ○ Yes, 1 time
- ○ Yes, 2 times
- ○ Yes, 3 times
- ○ Yes, 4 or more times

THE NEXT THREE QUESTIONS ARE ABOUT THE SEXUAL HARASSMENT SITUATION WHICH HAD THE GREATEST EFFECT ON YOU.

18. Who sexually harassed YOU? MARK ONE.

- ○ An officer
- ○ An NCO
- ○ An enlisted person (not an NCO)
- ○ A civilian employee of the Army
- ○ Someone else

19. Was this person in your unit? ○ No ○ Yes

20. Did you report the sexual harassment incident to your chain of command or other military authority? MARK ONE.

- ○ Yes, but I am not aware of the results.
- ○ Yes, and something was done.
- ○ Yes, and nothing was done about it.
- ○ No, I handled it myself.
- ○ No, I didn't think anyone would do anything about it.
- ○ No, it was a minor incident and it didn't really bother me.
- ○ No, I was afraid of reprisals from the chain of command.

21. Since arriving at your present Army post, have you been subjected to discrimination? MARK ALL THAT APPLY.

- ○ No
- ○ Yes, racial
- ○ Yes, religious
- ○ Yes, gender (sex)
- ○ Yes, national origin
- ○ Yes, other (age, weight, etc.) PLEASE LIST BELOW.

_____

THE NEXT QUESTION IS ABOUT THE DISCRIMINATION SITUATION WHICH HAD THE GREATEST EFFECT ON YOU.

22. Did you report the discrimination incident to your chain of command or other military authority? MARK ONE.

- ○ Does not apply; I have not been subjected to discrimination.
- ○ Yes, but I am not aware of the results.
- ○ Yes, and something was done.
- ○ Yes, and nothing was done about it.
- ○ No, I handled it myself.
- ○ No, I didn't think anyone would do anything about it.
- ○ No, it was a minor incident and it didn't really bother me.
- ○ No, I was afraid of reprisals from the chain of command.

23. Since arriving at your present Army post, has military justice been administered fairly to you and your peers?

- Yes
- No
- Don't know

24. Since arriving at your present Army post, was the most severe punishment for the same type of offense usually given to: MARK ALL THAT APPLY.

- Does not apply; all are treated the same.
- Men
- Women
- Whites
- Blacks
- Hispanics
- Some other race/ethnic group (PLEASE LIST)

_____

25. Please indicate your level of satisfaction with the following aspects of Army life at the present time. MARK A RESPONSE FOR EACH.

Very satisfied
Satisfied
Neither satisfied nor dissatisfied
Dissatisfied
Very dissatisfied

How satisfied are you with ...

a. your relationships with peers? ①②③④⑤
b. your relationships with non-commissioned officers? ①②③④⑤
c. your relationships with commissioned officers? ①②③④⑤
d. the Army's gender mix? ①②③④⑤
e. discipline? ①②③④⑤
f. barracks living? ①②③④⑤
g. physical fitness training? ①②③④⑤
h. your amount of personal freedom? ①②③④⑤
i. the Army's structured, ordered lifestyle? ①②③④⑤
j. the length of your enlistment contract? ①②③④⑤
k. your MOS? ①②③④⑤
l. the time available to pursue your personal life goals? ①②③④⑤
m. your life as an enlisted soldier? ①②③④⑤
n. being away from family and friends? ①②③④⑤
o. your personal and family life? ①②③④⑤

26. How much do you agree or disagree with the following statements about your most recent training unit?

Strongly agree
Agree
Neither agree nor disagree
Disagree
Strongly disagree
Not applicable

a. The leaders in the unit set high standards for soldiers in terms of good behavior and discipline ①②③④⑤⑥
b. The leaders in the unit were more interested in looking good than being good ①②③④⑤⑥
c. I was impressed with the quality of leadership in the unit ①②③④⑤⑥
d. I would go for help with a personal problem to people in my chain of command ①②③④⑤⑥
e. The leaders in the unit were not concerned with the way soldiers treat each other as long as the job/training gets done ①②③④⑤⑥
f. The leaders in the unit were more interested in furthering their careers than in the well-being of their soldiers ①②③④⑤⑥
g. Leaders in the unit treated soldiers with respect ①②③④⑤⑥
h. The leaders most always got willing and whole-hearted cooperation from the soldiers in the unit ①②③④⑤⑥
i. The NCOs in my chain of command were a good source of support for soldiers ①②③④⑤⑥

27. Suppose your drill sergeants were to compare your performance to other soldiers in your training company. How would they rate your ...

Truly exceptional (top 5%)
Outstanding (upper 15%)
Above average (upper 30%)
Average (middle 40%)
Below average (bottom 30%)

a. EFFORT (such as willingness to give your best effort and assist others to make sure the job gets done) ①②③④⑤
b. PERSONAL DISCIPLINE (such as willingness to follow Army regulations, orders, and Standard Operating Procedure, and display respect for superiors) ①②③④⑤
b. PHYSICAL FITNESS (effectiveness in maintaining military standards of physical fitness) ①②③④⑤
c. OVERALL EFFECTIVENESS IN MOST RECENT TRAINING ①②③④⑤

28 From what you know and have heard about the Army and civilian life, please indicate how you believe conditions in the military are compared with conditions in a civilian job you could realistically expect to get. MARK A RESPONSE FOR EACH.

	Much better in Army	Somewhat better in Army	About the same	Somewhat better in civilian life	Much better in civilian life	Don't know
a. Pay	①	②	③	④	⑤	⑥
b. Retirement benefits	①	②	③	④	⑤	⑥
c. Benefits other than retirement	①	②	③	④	⑤	⑥
d. Assistance for civilian education	①	②	③	④	⑤	⑥
e. Opportunities to advance in your chosen field	①	②	③	④	⑤	⑥
f. Opportunities for job satisfaction	①	②	③	④	⑤	⑥
g. Quality of co-workers	①	②	③	④	⑤	⑥
h. Working hours/schedule	①	②	③	④	⑤	⑥
i. Time for personal/family life	①	②	③	④	⑤	⑥
j. Overall quality of life	①	②	③	④	⑤	⑥
k. Level of professionalism in the organization	①	②	③	④	⑤	⑥
l. Personal freedom	①	②	③	④	⑤	⑥
m. Job security	①	②	③	④	⑤	⑥
n. Total family income	①	②	③	④	⑤	⑥

29. The kind of work I enjoy most is available:

- ○ only in the military.
- ○ primarily in the military.
- ○ equally in the military and civilian world.
- ○ primarily in the civilian world.
- ○ only in the civilian world.
- ○ Don't know

30. Please indicate your level of agreement with using the Army for the following types of missions. MARK A RESPONSE FOR EACH.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. Combat the flow of illegal drugs into the U.S.	①	②	③	④	⑤
b. Provide humanitarian relief in the U.S. in areas hit by a major disaster	①	②	③	④	⑤
c. Provide humanitarian relief outside the U.S. (such as Bosnia, Somalia, Rwanda, Haiti)	①	②	③	④	⑤
d. Be part of a United Nations peace-keeping force wherever needed	①	②	③	④	⑤
e. Combat terrorism which threatens U.S. citizens	①	②	③	④	⑤
f. Maintain a military presence in overseas areas of vital interest to the U.S. in order to prevent problems	①	②	③	④	⑤
g. Provide training to federal, state, and other public employees	①	②	③	④	⑤

31. How confident are you that you will: MARK A RESPONSE FOR EACH.

	Extremely Confident	Very Confident	Moderately Confident	Slightly Confident	Not Confident At All
a. Adapt to Army life	①	②	③	④	⑤
b. Complete your term of obligation	①	②	③	④	⑤
c. Meet the Army's physical requirements	①	②	③	④	⑤
d. Have the skills to perform well in your next assignment	①	②	③	④	⑤
e. Earn promotions in the Army	①	②	③	④	⑤

32. How important is each of the following TO YOU PERSONALLY?

	Extremely important	Very important	Quite important	Moderately important	Somewhat important	Slightly important	Not at all important
a. Loyalty to the United States Army	①	②	③	④	⑤	⑥	⑦
b. Loyalty to your unit or organization	①	②	③	④	⑤	⑥	⑦
c. Taking responsibility for your actions and decisions	①	②	③	④	⑤	⑥	⑦
d. Putting what is good for your fellow soldiers, unit, and the nation before your own welfare	①	②	③	④	⑤	⑥	⑦
e. Dedication to serving the United States, even to risking your own life in its defense	①	②	③	④	⑤	⑥	⑦
f. Commitment to working as a member of a team	①	②	③	④	⑤	⑥	⑦
g. Dedication to learning your job and doing it well	①	②	③	④	⑤	⑥	⑦
h. Personal drive to succeed in your work and advance	①	②	③	④	⑤	⑥	⑦
i. Being honest, open, and truthful	①	②	③	④	⑤	⑥	⑦
j. Being disciplined and courageous in battle	①	②	③	④	⑤	⑥	⑦
k. Standing up for what you firmly believe is right	①	②	③	④	⑤	⑥	⑦
l. Working with others tactfully and with military courtesy	①	②	③	④	⑤	⑥	⑦
m. Exhibiting excellent military bearing and appearance	①	②	③	④	⑤	⑥	⑦
n. Equal opportunity regardless of gender	①	②	③	④	⑤	⑥	⑦
o. High moral standards both on-duty and off-duty	①	②	③	④	⑤	⑥	⑦
p. Building and maintaining physical fitness and stamina	①	②	③	④	⑤	⑥	⑦

As you see it now, how well do your personal values match the values of the Army?

- Extremely well
- Very well
- Neither well nor poorly
- Poorly
- Not at all

34. As you see it now, to what extent are you the type of individual that the Army wants as a soldier?

- Very great extent
- Great extent
- Moderate extent
- Slight extent
- Not at all

35. Assume you were to leave the Army in the next six months. Which of the following reasons would likely apply in your case? RESPOND TO EACH ITEM.

	Not Likely to Apply	Likely to Apply
a. Failure to meet physical requirements	○	○
b. Problems adjusting to Army life	○	○
c. Family problems at home	○	○
d. Pregnancy	○	○
e. One or more serious (UCMJ) offenses	○	○
f. Minor offenses or disciplinary problems	○	○
g. Poor academic performance	○	○
h. Illness/medical condition	○	○
i. Homesickness	○	○
j. Lack of motivation, boredom	○	○
k. Problems with supervisors	○	○
l. Racial discrimination	○	○
m. Sexual or gender discrimination	○	○
n. Better job opportunities outside the Army	○	○
o. Injuries sustained during training	○	○
p. Not getting desired military job	○	○
q. Sexual harassment	○	○
r. Not getting along with others	○	○
s. Maintaining weight standards	○	○
t. Drug/alcohol abuse	○	○
u. Mental health problems	○	○
v. Unfair punishment	○	○
w. Verbal abuse from training staff members	○	○

36. At the present time, what level of strain, conflict or stress -- if any -- are you experiencing?

- Very high
- High
- Moderate
- Low
- Very low
- None

37. How would you rate your current level of morale?

- Very high
- High
- Moderate
- Low
- Very low

38. Considering both your own qualifications and current labor market conditions, how difficult do you think it would be for you to find a good civilian job right now?

- Very difficult
- Difficult
- Not particularly difficult or easy
- Easy
- Very easy
- Does not apply; I already have a good civilian job

39. My personal or family situation would make it difficult for me to leave the Army in the next year or so.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

40. A male friend who you think is qualified asks your advice about joining the Army. Would you recommend that he ...

- join the Army?
- join another military service?
- not join a military service?

41. A female friend who you think is qualified asks your advice about joining the Army. Would you recommend that she ...

- join the Army?
- join another military service?
- not join a military service?

42. Are you:

- Male
- Female

43. Are you of Hispanic/Spanish origin or ancestry (of any race)?

- No
- Yes, Mexican, Mexican-American, Chicano
- Yes, Puerto Rican
- Yes, other Hispanic/Spanish

44. What is your racial background?

- American Indian, Eskimo or Aleut
- Asian or Pacific Islander
- Black
- White

45. What is your current marital status?

- Married
- Legally separated or filing for divorce
- Single, never married
- Single, engaged to be married
- Divorced
- Widowed

46. How many dependent children do you have (for whom you provide financial support)?
- None
- 1
- 2
- 3
- 4 or more

47. Is there an important girlfriend/boyfriend in your life right now?
- Does not apply; I am currently married
- Yes
- No

48. How supportive/unsupportive is your spouse/girlfriend/boyfriend of your making a career of the Army?
- Does not apply; I do not have a spouse/girlfriend/boyfriend
- Very supportive
- Fairly supportive
- Mixed or neutral
- Fairly unsupportive
- Very unsupportive

49. Did you finish high school?
- No
- Yes. If yes, choose the credential(s) you earned when you finished high school. Fill in **at least one circle:**
  - Diploma – earned from a public or private **traditional day school**
  - Diploma – earned from an **adult (continuation)** school
  - Diploma – issued by parents or tutors for **home schooling**
  - Diploma – issued by an association, school, or state for **home schooling**
  - Diploma – issued by a **vocational or technical** school
  - Diploma – issued by a **correspondence** school
  - **GED equivalency** diploma
  - Certificate – for high school **attendance or completion**

50. Are you planning to go to college?
- Yes, while on active duty during this enlistment
- Yes, after I complete this term of duty
- No
- Undecided

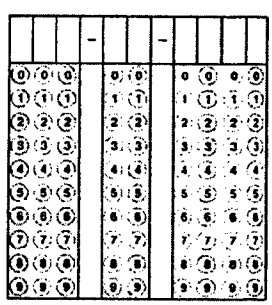
51. How IMPORTANT TO YOU is it that you complete your enlistment obligation?
- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

52. Which ONE of the following best describes your current active duty Army career intentions? MARK ONE.
- PROBABLY stay until retirement
- DEFINITELY stay until retirement
- PROBABLY stay in beyond my present obligation, but not necessarily to retirement
- DEFINITELY stay in beyond my present obligation, but not necessarily to retirement
- PROBABLY leave upon completion of my present obligation
- DEFINITELY leave upon completion of my present obligation
- Does not apply; I am not active duty Army

53. How many years of active duty service do you expect to have completed by the time you leave the Army? (Zero if no active duty)

54. Do any of the following cause you to be unsure about an Army career? MARK ALL THAT APPLY.
- My lack of experience in the Army
- My career goals are unclear
- Unsure of chances for promotion
- Changes in Army job opportunities
- Changes in the Army mission
- Possibility of being subjected to sexual or racial discrimination
- None of the above

55. Enter your Social Security Number below.



R14898-PFI-5432

SURVEY APPROVAL AUTHORITY: U.S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES
SURVEY CONTROL NUMBER: TAPC-ARI-AO-01-08
RCS: MILPC-3

Annual First-Term Survey 2001

FEBRUARY 2001

The **Annual First-Term Survey 2001** is part of a research project to evaluate the attitudes and experiences of enlisted personnel during their careers in the United States Army. The U.S. Army Research Institute (ARI) will assess the expectations and impressions of new recruits, of soldiers completing initial entry training, and of soldiers in operational units. The project covers a wide range of issues related to soldiers' jobs, careers, and the Army as a whole. The overall purpose is to provide senior Army leaders with information for recruiting, training, and retaining a high-quality force of soldiers.

Thank you for your support for this survey program.

NOTICE

1. **READ CAREFULLY EACH QUESTION AND ALL THE POSSIBLE RESPONSES** before selecting your response.

2. **DO NOT FOLD, TEAR, CUT, TRIM, STAPLE OR TAPE CLOSED, OR PLACE A LABEL ON THE QUESTIONNAIRE.**

3. **PROVIDE YOUR BACKGROUND INFORMATION.** The information asked in the section on page 11 is essential for analyzing the data. Please answer these questions.

4. **YOUR PARTICIPATION IS NEEDED.** The Army needs information from you in order to make informed decisions. Failure to respond to any question will not result in any penalty. However, your participation is encouraged so that the data will be complete and representative of all first-term soldiers.

5. **USE THE RETURN ENVELOPE.** After you have completed the survey, please place the questionnaire in the envelope provided, seal the envelope, and return it to your unit point-of-contact. The envelope is provided to help protect your privacy.

PRIVACY ACT STATEMENT

1. The Department of the Army may collect the information requested in this survey under the authority of 10 United States Code 2358. Providing information is this questionnaire is voluntary. Failure to respond to any specific question will not result in any penalty.

2. Public Law 93-573 (Privacy Act of 1974) requires that you be informed of the purpose and uses to be made of the information collected. The information collected in the survey will be used solely for research purposes. Your Social Security Number (SSN) is requested only for linking data files. Use of SSNs is authorized by Executive Order 9397. In accordance with federal regulations, the survey data will be safeguarded to protect your privacy. After we have used your SSN to create the data files, a new identification code will be created to replace your SSN. The file linking your SSN to the new ID code will be properly secured to preserve confidentiality. Only survey statisticians involved in collecting or preparing the information for analysis will have access to completed questionnaires. Only group statistics will be reported.

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL
300 ARMY PENTAGON
WASHINGTON, DC 20310-0300

REPLY TO
ATTENTION OF

DAPE-ZA

31 JAN 2001

MEMORANDUM FOR SURVEY PARTICIPANTS

SUBJECT: *Survey to Members of the Fiscal Year 1999 Accession Cohort*

1. The enclosed survey is one of the surveys that the Army is administering to soldiers who entered service during Fiscal Year 1999. The surveys will give senior leadership information on how to recruit and keep new soldiers in the Army.

2. Your careful attention to each survey item is essential. Your responses here will be combined with responses made by you and other soldiers to earlier surveys. In no case will information be provided that tracks back to any individual soldier.

3. I personally appreciate your time and cooperation in completing this survey.

Encl

TIMOTHY J. MAUDE
Lieutenant General, GS
Deputy Chief of Staff
for Personnel

Printed on Recycled Paper

MARKING INSTRUCTIONS

GENERAL INSTRUCTIONS

- **Please** use a **No. 2 pencil.**

- **Make** heavy black marks that fill the circle for your answer.
- **Please do not** make stray marks of any kind.

INCORRECT MARKS ✓ ✗ ◐ ●

CORRECT MARK ○ ● ○ ○

Marking all that apply

Sometimes you will be asked to "MARK ALL THAT APPLY." When this instruction appears, you **may mark more than one answer.**

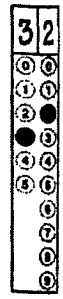
EXAMPLE:

Other than currently serving in the Active Component of the Army, what other types of experiences have you had with the military? MARK ALL THAT APPLY.

- ○ I served in the National Guard/Reserves.
- ○ Child of parent(s)/guardian who is/was on active duty with the U.S. Armed Forces.
- ● Brother/sister is/was on active duty with the U.S. Armed Forces.
- ○ Spouse is/was on active duty with the U.S. Armed Forces.
- ● Military high school
- ○ Junior Reserve Officer Training Program (JROTC)
- ○ Other military experience (Please list on page 19.)
- ○ None of the above

Marking numbers

Sometimes you will be asked to give numbers for your answer by filling in a grid. If you are asked to give numbers, please record the numbers in the boxes above the grid, then fill in the circles of the grid as shown to the right.



EXAMPLE:

Which ONE of the 56 items on this page made you *FIRST THINK* about leaving the Army?

- ○ My reason is not listed (Please list on page 19.)

Selecting only one response

Sometimes you will be asked to mark one response from a list of possible items.

EXAMPLE:

Which ONE of the following describes your current active duty Army career intentions? MARK ONE.

- ○ PROBABLY stay until retirement
- ○ DEFINITELY stay until retirement
- ● PROBABLY stay in beyond my present obligation, but not necessarily to retirement
- ○ DEFINITELY stay in beyond my present obligation, but not necessarily to retirement
- ○ PROBABLY leave upon completion of my present obligation
- ○ DEFINITELY leave upon completion of my present obligation

Using a common scale for more than one question

Sometimes you will be asked to "MARK A RESPONSE FOR EACH" to answer a number of different questions.

EXAMPLE:

Do you agree or disagree with the following? MARK A RESPONSE FOR EACH.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I believe that the Army leadership will make the best decisions to maintain a quality Army	①	●	③	④	⑤
The Army will protect my benefits and retirement	①	②	●	④	⑤
Senior Army leaders are aware of the frustration and anxieties that accompany the possible loss of one's job or career	①	②	③	●	⑤

1. **How long have you been at your current *operational unit*?**
   - ○ Does not apply, still in training
   - ○ Less than 6 months
   - ○ More than 6 months, less than 1 year
   - ○ More than 1 year, less than 18 months
   - ○ More than 18 months, less than 2 years
   - ○ More than 2 years

2. **To what extent have your Army training and experiences ....**
   MARK ONE RESPONSE FOR EACH.

	Very great extent	Great extent	Moderate extent	Slight extent	Not at all	No basis to judge
a. contributed towards your professional development?	①	②	③	④	⑤	⑥
b. instilled Army values?	①	②	③	④	⑤	⑥
c. prepared you to perform your Army duties?	①	②	③	④	⑤	⑥
d. prepared you for future assignments?	①	②	③	④	⑤	⑥

3. **How realistic were the expectations you had about Army life before you joined the Army?**
   - ○ Very realistic
   - ○ Mostly realistic
   - ○ Mostly unrealistic
   - ○ Very unrealistic

4. **How well has Army life compared with your expectations before you joined the Army?**
   - ○ Much better than I expected
   - ○ Somewhat better than I expected
   - ○ About the same as I expected
   - ○ Somewhat worse than I expected
   - ○ Much worse than I expected

5. **How realistic were the expectations you had about your MOS at the time you joined the Army?**
   - ○ Very realistic
   - ○ Mostly realistic
   - ○ Mostly unrealistic
   - ○ Very unrealistic

6. **How has the work you do in your MOS compared with your expectations at the time you joined the Army?**
   - ○ Much better than I expected
   - ○ Somewhat better than I expected
   - ○ About the same as I expected
   - ○ Somewhat worse than I expected
   - ○ Much worse than I expected

7. **How does your physical health compare now to what it was when you first entered the Army?**
   - ○ Much better now
   - ○ Somewhat better now
   - ○ About the same as it was
   - ○ Somewhat worse now
   - ○ Much worse now

8. **How has your commitment to an Army career changed since you entered the Army?**
   - ○ Much greater now
   - ○ Somewhat greater now
   - ○ About the same as it was
   - ○ Somewhat less now
   - ○ Much less now

9. **How confident are you that you will ....**
   MARK ONE RESPONSE FOR EACH.

	Extremely confident	Very confident	Moderately confident	Slightly confident	Not confident at all
a. be able to adjust to the demands of Army life over time?	①	②	③	④	⑤
b. complete your term of obligation?	①	②	③	④	⑤
c. maintain the required level of physical fitness?	①	②	③	④	⑤
d. have the skills to perform well in future assignments?	①	②	③	④	⑤
e. earn promotions in the Army?	①	②	③	④	⑤

10. **To what extent do you feel the following are problems in the Army?**
    MARK ONE RESPONSE FOR EACH.

	Very great extent	Great extent	Moderate extent	Slight extent	Not at all	No basis to judge
a. Sexual harassment	①	②	③	④	⑤	⑥
b. Sexual discrimination	①	②	③	④	⑤	⑥
c. Racial/ethnic discrimination	①	②	③	④	⑤	⑥
d. Unfair promotion practices	①	②	③	④	⑤	⑥
e. Unfair military justice system	①	②	③	④	⑤	⑥

11. Please indicate your level of agreement with the following statements.
MARK ONE RESPONSE FOR EACH.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The Army will allow me to maintain the standard of living I want for myself/my family	①	②	③	④	⑤
b. The Army will allow me to maintain the kind of balance I want between my work and personal life	①	②	③	④	⑤
c. I would discourage a close friend from joining the Army	①	②	③	④	⑤
d. The demands of the Army make it difficult to have the kind of family life I would like	①	②	③	④	⑤
e. I can count on Army people to help out when needed	①	②	③	④	⑤
f. I frequently feel like leaving the Army	①	②	③	④	⑤
g. I am quite proud to tell people that I am in the Army	①	②	③	④	⑤
h. For me, a rewarding career can compensate for limited personal/ family time	①	②	③	④	⑤
i. The Army has a great deal of personal meaning to me	①	②	③	④	⑤
j. I feel a strong sense of belonging to the Army	①	②	③	④	⑤
k. I feel "emotionally attached" to the Army	①	②	③	④	⑤
l. One of the problems of leaving the Army would be the lack of good alternatives	①	②	③	④	⑤
m. My personal or family situation would make it difficult for me to leave the Army in the next year or so	①	②	③	④	⑤
n. I feel like "part of the family" in the Army	①	②	③	④	⑤

12. How much do you agree or disagree with the following statements about your current unit?
MARK ONE RESPONSE FOR EACH.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The leaders in my unit set high standards for soldiers in terms of good behavior and discipline	①	②	③	④	⑤
b. I am impressed with the quality of leadership in my unit	①	②	③	④	⑤
c. I would go for help with a personal problem to people in my chain of command	①	②	③	④	⑤
d. The leaders in my unit treat soldiers with respect	①	②	③	④	⑤
e. The members of my unit know what is expected of them	①	②	③	④	⑤
f. Rules are consistently enforced in my unit	①	②	③	④	⑤
g. The priorities in my unit are clear	①	②	③	④	⑤
h. The reasons for being rewarded in my unit are well-known	①	②	③	④	⑤
i. The leaders in my unit set the right example by their actions	①	②	③	④	⑤
j. Members in my unit work well together as a team	①	②	③	④	⑤
k. The behaviors that will get you in trouble or punished are well-known in my unit	①	②	③	④	⑤
l. The NCOs in my chain of command are a good source of support for soldiers	①	②	③	④	⑤
m. My unit's mission is very important	①	②	③	④	⑤
n. I play an important part in accomplishing my unit's mission	①	②	③	④	⑤
o. I am proud to be a member of my unit	①	②	③	④	⑤

13. **Please indicate your level of satisfaction with the following aspects of Army life at the present time. MARK ONE RESPONSE FOR EACH.**

	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
a. Your relationship with your peers	①	②	③	④	⑤
b. Your relationship with non-commissioned officers	①	②	③	④	⑤
c. Your relationship with commissioned officers	①	②	③	④	⑤
d. Your relationship with warrant officers	①	②	③	④	⑤
e. The Army's gender mix	①	②	③	④	⑤
f. Discipline	①	②	③	④	⑤
g. Available housing	①	②	③	④	⑤
h. Physical fitness training	①	②	③	④	⑤
i. Your amount of personal freedom	①	②	③	④	⑤
j. The Army's structured, ordered lifestyle	①	②	③	④	⑤
k. The length of your enlistment contract	①	②	③	④	⑤
l. Your MOS	①	②	③	④	⑤
m. The time available to pursue your personal life goals	①	②	③	④	⑤
n. Your life as an enlisted soldier	①	②	③	④	⑤
o. Being away from family and friends	①	②	③	④	⑤
p. Your personal and family life	①	②	③	④	⑤

14. **How important is each of the following to you personally? MARK ONE RESPONSE FOR EACH.**

	Extremely important	Very important	Quite important	Moderately important	Somewhat important	Slightly important	Not at all important
a. Loyalty to the United States Army	①	②	③	④	⑤	⑥	⑦
b. Loyalty to your unit or organization	①	②	③	④	⑤	⑥	⑦
c. Taking responsibility for your actions and decisions	①	②	③	④	⑤	⑥	⑦
d. Putting what is good for your fellow soldiers, unit, and nation before your own welfare	①	②	③	④	⑤	⑥	⑦
e. Dedication to serving the United States, even to risking your own life in its defense	①	②	③	④	⑤	⑥	⑦
f. Commitment to working as a member of a team	①	②	③	④	⑤	⑥	⑦
g. Dedication to learning your job and doing it well	①	②	③	④	⑤	⑥	⑦
h. Personal drive to succeed in your work and advance	①	②	③	④	⑤	⑥	⑦
i. Being honest, open, and truthful	①	②	③	④	⑤	⑥	⑦
j. Being disciplined and courageous in battle	①	②	③	④	⑤	⑥	⑦
k. Standing up for what you firmly believe is right	①	②	③	④	⑤	⑥	⑦
l. Working with others tactfully and with military courtesy	①	②	③	④	⑤	⑥	⑦
m. Exhibiting excellent military bearing and appearance	①	②	③	④	⑤	⑥	⑦
n. Equal opportunity regardless of gender	①	②	③	④	⑤	⑥	⑦
o. High moral standards both on-duty and off-duty	①	②	③	④	⑤	⑥	⑦
p. Building and maintaining physical fitness and stamina	①	②	③	④	⑤	⑥	⑦

15. **As you see it now, how well do your personal values match the values of the Army?**

- ○ Extremely well
- ○ Very well
- ○ Neither well nor poorly
- ○ Poorly
- ○ Not at all

16. **Suppose your immediate supervisor were to compare your performance to other soldiers in your unit. How would they rate your ... MARK ONE RESPONSE FOR EACH.**

	Truly exceptional (top 5%)	Outstanding (upper 15%)	Above average (upper 30%)	Average (middle 40%)	Below average (bottom 30%)
a. EFFORT (such as willingness to give your best effort and assist others to make sure the job gets done)	①	②	③	④	⑤
b. PERSONAL DISCIPLINE (such as willingness to follow Army regulations, orders, and Standard Operating Procedures, and display respect for superiors)	①	②	③	④	⑤
c. PHYSICAL FITNESS (effectively maintaining military standards of physical fitness)	①	②	③	④	⑤
d. OVERALL EFFECTIVENESS	①	②	③	④	⑤

17. **As you see it now, to what extent are you the type of individual that the Army wants as a soldier?**

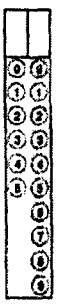
- ○ Very great extent
- ○ Great extent
- ○ Moderate extent
- ○ Slight extent
- ○ Not at all

18. **Based on your Army experience, how satisfied or dissatisfied are you with the following? MARK ONE RESPONSE FOR EACH.**

	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
a. Amount of enjoyment from my job	①	②	③	④	⑤
b. Level of job fulfillment/challenge	①	②	③	④	⑤
c. Use of my skills and training on the job	①	②	③	④	⑤
d. Control over my job assignments	①	②	③	④	⑤
e. Geographic location of jobs	①	②	③	④	⑤
f. Level of fairness in how my performance is evaluated	①	②	③	④	⑤
g. Level of recognition for my accomplishments	①	②	③	④	⑤
h. Assignments to jobs offering technical/professional development	①	②	③	④	⑤
i. Opportunity to select a job, training, or station of my choice	①	②	③	④	⑤
j. Access to education/training	①	②	③	④	⑤
k. Overseas duty	①	②	③	④	⑤
l. Frequency of deployments	①	②	③	④	⑤
m. Quality of medical care	①	②	③	④	⑤
n. Availability of medical care	①	②	③	④	⑤
o. Quality of military recreational services	①	②	③	④	⑤
p. Availability of military recreation services	①	②	③	④	⑤
q. Quality of military family services	①	②	③	④	⑤
r. Availability of military family services	①	②	③	④	⑤

19. **During the last 12 months, how many WEEKS have you been away from your duty station for your military duties (including deployments, assignments, training, TDY)?**
- ○ Not been away at all
- ○ Less than 1 week

NUMBER OF WEEKS AWAY



20. **During the last 12 months, how many times have you been DEPLOYED?**
- ○ Not at all in the last 12 months
- ○ Once
- ○ Twice
- ○ Three or more times

21. **During the last 12 months, have you been DEPLOYED for any of the following reasons? MARK ALL THAT APPLY.**
- ○ Not applicable; I have not been deployed during the last 12 months
- ○ I have participated in a warfighting deployment
- ○ I have participated in a peacekeeping deployment
- ○ I have participated in a humanitarian assistance or disaster relief deployment

22. **Please indicate your level of agreement with the use of the Army for the following types of missions. MARK ONE RESPONSE FOR EACH.**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. Warfighting	①	②	③	④	⑤
b. Peacekeeping	①	②	③	④	⑤
c. Humanitarian assistance/disaster relief	①	②	③	④	⑤

23. **At the present time, what level of strain, conflict, or stress–if any–are you experiencing?**
- ○ Very high
- ○ High
- ○ Moderate
- ○ Low
- ○ Very low
- ○ None

24. **How would you rate your current level of morale?**
- ○ Very high
- ○ High
- ○ Moderate
- ○ Low
- ○ Very low

25. **Since completing training (AIT, OSUT), have you gotten into any serious trouble (e.g., UCMJ offenses, Article 15s, letters of reprimand)?**
- ○ No
- ○ Yes, just once
- ○ Yes, two or three times
- ○ Yes, four or more times

26. **Assume you were to leave the Army in the next 6 months. Which of the following reasons would be likely to apply to your case? RESPOND TO EACH ITEM.**

	Unlikely to apply	Likely to apply
a. Failure to meet minimum physical requirements	①	②
b. Family problems at home	①	②
c. Pregnancy	①	②
d. One or more serious (UCMJ) offenses	①	②
e. Minor offenses or disciplinary problems	①	②
f. Lack of motivation, boredom	①	②
g. Problems with supervisors	①	②
h. Better job opportunities outside the Army	①	②
i. Meeting weight standards	①	②
j. Drug/alcohol use	①	②
k. Mental health problems	①	②

27. **Are you planning on going to college?**
- ○ Yes, I am currently enrolled in college
- ○ Yes, on active duty, later in this enlistment
- ○ Yes, after I complete this term of duty
- ○ No
- ○ Undecided

28. **Considering both your own qualifications and current labor market conditions, how difficult do you think it would be for you to find a good civilian job right now?**
- ○ Very difficult
- ○ Difficult
- ○ Not particularly difficult or easy
- ○ Easy
- ○ Very easy

29. From **what** you know about Army and civilian life, please **indicate** how you believe conditions in the military **are** compared with conditions in a civilian job you **could** realistically expect to get. **MARK ONE RESPONSE FOR EACH.**

	Much better in Army	Somewhat better in Army	About the same in each	Somewhat better in civilian life	Much better in civilian life
a. Pay	①	②	③	④	⑤
b. Retirement benefits	①	②	③	④	⑤
c. Benefits other than retirement	①	②	③	④	⑤
d. Assistance for civilian education	①	②	③	④	⑤
e. Opportunities to advance in your chosen field	①	②	③	④	⑤
f. Opportunities for job satisfaction	①	②	③	④	⑤
g. Quality of co-workers	①	②	③	④	⑤
h. Work hours/schedule	①	②	③	④	⑤
i. Time for personal/family life	①	②	③	④	⑤
j. Overall quality of life	①	②	③	④	⑤
k. Level of integrity in the organization	①	②	③	④	⑤
l. Level of professionalism in the organization	①	②	③	④	⑤
m. Personal freedom	①	②	③	④	⑤
n. Job security	①	②	③	④	⑤
o. Total family income	①	②	③	④	⑤

30. **The kind of work I enjoy most is available ...**
- ○ only in the military.
- ○ primarily in the military.
- ○ equally in the military and civilian world.
- ○ primarily in the civilian world.
- ○ only in the civilian world.
- ○ don't know.

31. **What effect, if any, have your Army experiences had on the development of specific job knowledge, skills, and abilities that will help you perform a civilian job?**
- ○ Extremely positive effect
- ○ Very positive effect
- ○ Little effect
- ○ No effect
- ○ Don't know

32. **What effect, if any, have your Army experiences had on the development of personal characteristics and attitudes that will help you perform a civilian job?**
- ○ Strong positive effect
- ○ Positive effect
- ○ No effect
- ○ Negative effect
- ○ Strong negative effect
- ○ No basis to judge

33. **How supportive/unsupportive is your spouse/girlfriend/boyfriend of your completing your obligated term of service in the Army?**
- ○ Does not apply; I do not have a spouse/girlfriend/boyfriend
- ○ Very supportive
- ○ Fairly supportive
- ○ Mixed or neutral
- ○ Fairly unsupportive
- ○ Very unsupportive

34. **How satisfied are you with the support and concern the Army has for your family?**
- ○ Does not apply; I do not have dependent family members
- ○ Very satisfied
- ○ Satisfied
- ○ Neutral
- ○ Dissatisfied
- ○ Very dissatisfied

35. **The people most important to me would be extremely disappointed if I dropped out of the Army before completing my enlistment obligation.**
- ○ Strongly agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

36. **How IMPORTANT to you is it that you complete your current enlistment obligation?**
- ○ Extremely important
- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

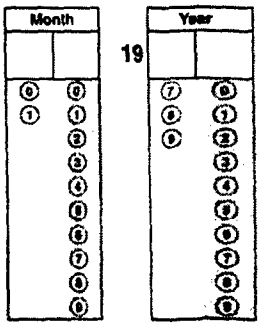
37. **Which ONE of the following best describes your current active duty Army career intentions? MARK ONE.**
- ○ DEFINITELY stay until retirement
- ○ PROBABLY stay until retirement
- ○ DEFINITELY stay beyond my present obligation, but not necessarily until retirement
- ○ PROBABLY stay beyond my present obligation, but not necessarily until retirement
- ○ PROBABLY leave after my present obligation
- ○ DEFINITELY leave after my present obligation

38. **How many years of active duty service do you expect to have completed by the time you leave the Army?**
- ○ 2 years or less
- ○ 3 years
- ○ 4 years
- ○ 5 - 9 years
- ○ 10 - 14 years
- ○ 15 - 19 years
- ○ 20 - 24 years
- ○ 25 - 29 years
- ○ 30 or more years

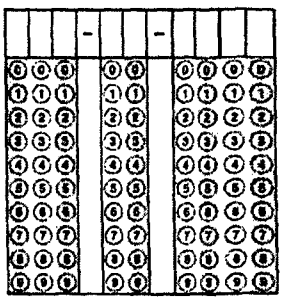
39. **What is your current marital status?**
- ○ Married
- ○ Legally separated or filing for divorce
- ○ Single, never married
- ○ Single, engaged to be married
- ○ Divorced
- ○ Widowed

40. **How many dependent children do you have (for whom you provide financial support)?**
- ○ None
- ○ 1
- ○ 2
- ○ 3
- ○ 4 or more

41. **In what month and year did you begin basic training?**



42. **Please write your Social Security Number in the boxes below and then fill in the appropriate circles in the grid.**



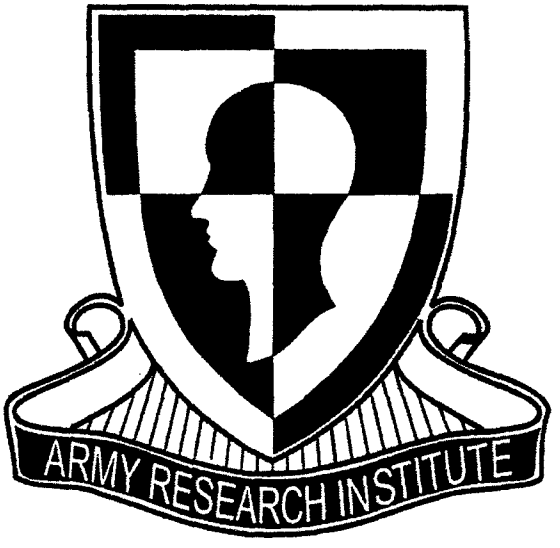
THANK YOU FOR YOUR ASSISTANCE. Please place the completed questionnaire in the envelope provided, seal the envelope, and return it to your unit point-of-contact. The envelope is provided to help protect your privacy.

ADDITIONAL COMMENTS

If you would like to make any comments on the topics of this survey or any other Army topics of interest to you and your family members, please write them in the space below. If applicable, please indicate the question number to which your comment is related.

SURVEY APPROVAL AUTHORITY: U.S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES
SURVEY CONTROL NUMBER: TAPC-ARI-AO-02-08
RCS: MILPC-3

Annual First-Term Survey 2002



MARCH 2002

The **Annual First-Term Survey 2002** is part of a research project to evaluate the attitudes and experiences of enlisted personnel during their careers in the United States Army. The U.S. Army Research Institute (ARI) will assess the expectations and impressions of new recruits, of soldiers completing initial entry training, and of soldiers in operational units. The project covers a wide range of issues related to soldiers' jobs, careers, and the Army as a whole. The overall purpose is to provide senior Army leaders with information for recruiting, training, and retaining a high-quality force of soldiers.

Thank you for your support for this survey program.

NOTICE

1. **READ CAREFULLY EACH QUESTION AND ALL THE POSSIBLE RESPONSES** before selecting your response.

2. **DO NOT FOLD, TEAR, CUT, TRIM, STAPLE OR TAPE CLOSED, OR PLACE A LABEL ON THE QUESTIONNAIRE.**

3. **PROVIDE YOUR BACKGROUND INFORMATION.** The information asked in the section on page 12 is essential for analyzing the data. Please answer these questions.

4. **YOUR PARTICIPATION IS NEEDED.** The Army needs information from you in order to make informed decisions. Failure to respond to any question will not result in any penalty. However, your participation is encouraged so that the data will be complete and representative of all first-term soldiers.

5. **USE THE RETURN ENVELOPE.** After you have completed the survey, please place the questionnaire in the envelope provided, seal the envelope, and return it to your unit point-of-contact. The envelope is provided to help protect your privacy.

PRIVACY ACT STATEMENT

1. The Department of the Army may collect the information requested in this survey under the authority of 10 United States Code 2358. Providing information in this questionnaire is voluntary. Failure to respond to any specific question will not result in any penalty.

2. Public Law 93-573 (Privacy Act of 1974) requires that you be informed of the purpose and uses to be made of the information collected. The information collected in the survey will be used solely for research purposes. Your Social Security Number (SSN) is requested only for linking data files. Use of SSNs is authorized by Executive Order 9397. In accordance with federal regulations, the survey data will be safeguarded to protect your privacy. After we have used your SSN to create the data files, a new identification code will be created to replace your SSN. The file linking your SSN to the new ID code will be properly secured to preserve confidentiality. Only survey statisticians involved in collecting or preparing the information for analysis will have access to completed questionnaires. Only group statistics will be reported.

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL
WASHINGTON, DC 20310-0300

REPLY TO
ATTENTION OF

DAPE-ZA

1 March 2002

MEMORANDUM FOR SURVEY PARTICIPANTS

SUBJECT: *Survey to Members of the Fiscal Year 1999 Accession Cohort*

1. The Army is making an intensive effort to understand the experiences and opinions of all soldiers who entered the Army between 1 October 1998 and 30 September 1999 as a way of ensuring that we recruit, train, and retain the best soldiers possible to fight and win our nation's wars.

2. Insights from soldiers like you have been very helpful to us, the senior leaders of the Army, in shaping the Army of the future. Therefore, we hope you will provide us with your candid and honest appraisal. If you need more space to tell us more, please use the last page of the survey booklet.

3. We will do everything possible to guard your confidentiality. We do ask for your Social Security Number so that we can keep all of the information you provide in the same file. None of the information you provide will be released to anyone other than the researchers who are consolidating the information in a form that will help us to make better decisions.

4. I personally appreciate your time, cooperation, and promptness in completing this survey. When you have completed it, please put it in the sealed envelope we have provided and return it to your unit so that it can be mailed back to our researchers.

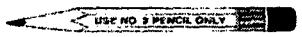
Encl

JOHN M. LE MOYNE
Lieutenant General, GS
Deputy Chief of Staff, G1

MARKING INSTRUCTIONS

GENERAL INSTRUCTIONS

- **Please** use a **No. 2 pencil.**



- **Make** heavy black marks that fill the circle for your answer.
- **Please do not** make stray marks of any kind.

INCORRECT MARKS ✓ ✗ , ▰ **CORRECT MARK** ○ ● ○ ○

Marking all that apply

Sometimes you will be asked to "MARK ALL THAT APPLY." When this instruction appears, you **may mark more than one answer.**

EXAMPLE:

Other than currently serving in the Active Component of the Army, what other types of experiences have you had with the military? MARK ALL THAT APPLY.

- ○ I served in the National Guard/Reserves.
- ○ Child of parent(s)/guardian who is/was on active duty with the U.S. Armed Forces.
- ● Brother/sister is/was on active duty with the U.S. Armed Forces.
- ○ Spouse is/was on active duty with the U.S. Armed Forces.
- ● Military high school
- ○ Junior Reserve Officer Training Program (JROTC)
- ○ Other military experience (Please list on page 19.)
- ○ None of the above

Marking numbers

Sometimes you will be asked to give numbers for your answer by filling in a grid. If you are asked to give numbers, please record the numbers in the boxes above the grid, then fill in the circles of the grid as shown to the right.

EXAMPLE:

Which ONE of the 56 items on this page made you *FIRST THINK* about leaving the Army?

- ○ My reason is not listed (Please list on page 19.)

Selecting only one response

Sometimes you will be asked to mark one response from a list of possible items.

EXAMPLE:

Which ONE of the following describes your current active duty Army career intentions? MARK ONE.

- ○ DEFINITELY stay until retirement
- ○ PROBABLY stay until retirement
- ● DEFINITELY stay beyond my present obligation, but not necessarily until retirement
- ○ PROBABLY stay beyond my present obligation but not necessarily until retirement
- ○ PROBABLY leave after my present obligation
- ○ DEFINITELY leave after my present obligation

Using a common scale for more than one question

Sometimes you will be asked to "MARK A RESPONSE FOR EACH" to answer a number of different questions.

EXAMPLE:

Do you agree or disagree with the following? MARK A RESPONSE FOR EACH.

	Strongly agree	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I believe that the Army leadership will make the best decisions to maintain a quality Army	○	●	○	○	○
The Army will protect my benefits and retirement	○	○	●	○	○
Senior Army leaders are aware of the frustration and anxieties that accompany the possible loss of one's job or career	○	○	○	●	○

1. **How long have you been at your current *operational unit*?**
   - Does not apply, still in training
   - Less than 6 months
   - More than 6 months, less than 1 year
   - More than one year, less than 18 months
   - More than 18 months, less than 2 years
   - More than 2 years

2. **To what extent have your Army training and experiences ...**
   MARK ONE RESPONSE FOR EACH.

	Very great extent	Great extent	Moderate extent	Slight extent	Not at all	No basis to judge
a. contributed towards your professional development?	①	②	③	④	⑤	⑥
b. instilled Army values?	①	②	③	④	⑤	⑥
c. prepared you to perform your Army duties?	①	②	③	④	⑤	⑥
d. prepared you for future assignments?	①	②	③	④	⑤	⑥

3. **How well has Army life compared with your expectations before you joined the Army?**
   - Much better than I expected
   - Somewhat better than I expected
   - About the same as I expected
   - Somewhat worse than I expected
   - Much worse than I expected

4. **How has the work you do in your MOS compared with your expectations at the time you joined the Army?**
   - Much better than I expected
   - Somewhat better than I expected
   - About the same as I expected
   - Somewhat worse than I expected
   - Much worse than I expected

5. **How does your physical health compare now to what it was when you first entered the Army?**
   - Much better now
   - Somewhat better now
   - About the same as it was
   - Somewhat worse now
   - Much worse now

6. **How has your commitment to an Army career changed since you entered the Army?**
   - Much greater now
   - Somewhat greater now
   - About the same as it was
   - Somewhat less now
   - Much less now

7. **How confident are you that you will ....**
   MARK ONE RESPONSE FOR EACH.

	Extremely confident	Very confident	Moderately confident	Slightly confident	Not confident at all
a. get assignments that match your skills and interests if you stay in the Army?	①	②	③	④	⑤
b. get the kinds of assignments that you need to be competitive for promotions?	①	②	③	④	⑤
c. maintain the required level of physical fitness?	①	②	③	④	⑤
d. have the skills to perform well in future assignments?	①	②	③	④	⑤
e. earn promotions in the Army?	①	②	③	④	⑤
f. have access to continuing your education if you stay in the Army?	①	②	③	④	⑤

8. **To what extent do you feel the following are problems in the Army?**
   MARK ONE RESPONSE FOR EACH.

	Very great extent	Great extent	Moderate extent	Slight extent	Not at all	No basis to judge
a. Sexual harassment	①	②	③	④	⑤	⑥
b. Sexual discrimination	①	②	③	④	⑤	⑥
c. Racial/ethnic discrimination	①	②	③	④	⑤	⑥
d. Unfair promotion practices	①	②	③	④	⑤	⑥
e. Unfair military justice system	①	②	③	④	⑤	⑥

9. **Please indicate your level of agreement with the following statements.**
MARK ONE RESPONSE FOR EACH.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The Army will allow me to maintain the standard of living I want for myself/my family	①	②	③	④	⑤
b. The Army will allow me to maintain the kind of balance I want between my work and personal life	①	②	③	④	⑤
c. I would discourage a close friend from joining the Army	①	②	③	④	⑤
d. The demands of the Army make it difficult to have the kind of family life I would like	①	②	③	④	⑤
e. I can count on Army people to help out when needed	①	②	③	④	⑤
f. I frequently feel like leaving the Army	①	②	③	④	⑤
g. I am quite proud to tell people that I am in the Army	①	②	③	④	⑤
h. For me, a rewarding career can compensate for limited personal/ family time	①	②	③	④	⑤
i. The Army has a great deal of personal meaning to me	①	②	③	④	⑤
j. I feel a strong sense of belonging to the Army	①	②	③	④	⑤
k. I feel "emotionally attached" to the Army	①	②	③	④	⑤
l. One of the problems of leaving the Army would be the lack of good alternatives	①	②	③	④	⑤
m. My personal or family situation would make it difficult for me to leave the Army in the next year or so	①	②	③	④	⑤
n. I feel like "part of the family" in the Army	①	②	③	④	⑤

10. **To what extent do you feel the following are problems in your CURRENT UNIT?**
MARK ONE RESPONSE FOR EACH.

	Very great extent	Great extent	Moderate extent	Slight extent	Not at all	No basis to judge
a. Low job commitment	①	②	③	④	⑤	⑥
b. Poor or inept leadership	①	②	③	④	⑤	⑥
c. Lack of discipline	①	②	③	④	⑤	⑥
d. Too few people to do work	①	②	③	④	⑤	⑥
e. Not enough training time	①	②	③	④	⑤	⑥
f. Too many non-military duties	①	②	③	④	⑤	⑥
g. Too much time away from post/garrison	①	②	③	④	⑤	⑥

11. **How much do you agree or disagree with the following statements about your current unit?**
MARK ONE RESPONSE FOR EACH.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The leaders in my unit set high standards for soldiers in terms of good behavior and discipline	①	②	③	④	⑤
b. I am impressed with the quality of leadership in my unit	①	②	③	④	⑤
c. I would go for help with a personal problem to people in my chain of command	①	②	③	④	⑤
d. The leaders in my unit treat soldiers with respect	①	②	③	④	⑤
e. The members of my unit know what is expected of them	①	②	③	④	⑤
f. Rules are consistently enforced in my unit	①	②	③	④	⑤

11. **How much do you agree or disagree with the following statements about your current unit? MARK ONE RESPONSE FOR EACH.** *(continued)*

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
g. The priorities in my unit are clear	①	②	③	④	⑤
h. The reasons for being rewarded in my unit are well-known	①	②	③	④	⑤
i. The leaders in my unit set the right example by their actions	①	②	③	④	⑤
j. Members in my unit work well together as a team	①	②	③	④	⑤
k. The behaviors that will get you in trouble or punished are well-known in my unit	①	②	③	④	⑤
l. The NCOs in my chain of command are a good source of support for soldiers	①	②	③	④	⑤
m. My unit's mission is very important	①	②	③	④	⑤
n. I play an important part in accomplishing my unit's mission	①	②	③	④	⑤
o. The members of my unit would look down on soldiers who leave the Army before completing their obligation	①	②	③	④	⑤
p. In my unit, leaders try to help soldiers stay in the Army even when they have trouble meeting standards	①	②	③	④	⑤
q. My unit's leaders actively encourage good soldiers to re-enlist	①	②	③	④	⑤
r. I am proud to be a member of my unit	①	②	③	④	⑤

12. **Please indicate your level of satisfaction with the following aspects of Army life <u>at the present</u> time. MARK ONE RESPONSE FOR EACH.**

	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
a. Your relationship with your peers	①	②	③	④	⑤
b. Your relationship with non-commissioned officers	①	②	③	④	⑤
c. Your relationship with commissioned officers	①	②	③	④	⑤
d. Your relationship with warrant officers	①	②	③	④	⑤
e. The Army's gender mix	①	②	③	④	⑤
f. Discipline	①	②	③	④	⑤
g. Available housing	①	②	③	④	⑤
h. Physical fitness training	①	②	③	④	⑤
i. Your amount of personal freedom	①	②	③	④	⑤
j. The Army's structured, ordered lifestyle	①	②	③	④	⑤
k. The length of your enlistment contract	①	②	③	④	⑤
l. Your MOS	①	②	③	④	⑤
m. The time available to pursue your personal life goals	①	②	③	④	⑤
n. Your life as an enlisted soldier	①	②	③	④	⑤
o. Being away from family and friends	①	②	③	④	⑤
p. Your personal and family life	①	②	③	④	⑤

13. **How important is each of the following to you personally? MARK ONE RESPONSE FOR EACH.**

	Extremely important	Very important	Quite important	Moderately important	Somewhat important	Slightly important	Not at all important
a. Loyalty to the United States Army	①	②	③	④	⑤	⑥	⑦
b. Loyalty to your unit or organization	①	②	③	④	⑤	⑥	⑦
c. Taking responsibility for your actions and decisions	①	②	③	④	⑤	⑥	⑦
d. Putting what is good for your fellow soldiers, unit, and nation before your own welfare	①	②	③	④	⑤	⑥	⑦
e. Dedication to serving the United States, even to risking your own life in its defense	①	②	③	④	⑤	⑥	⑦
f. Commitment to working as a member of a team	①	②	③	④	⑤	⑥	⑦
g. Dedication to learning your job and doing it well	①	②	③	④	⑤	⑥	⑦
h. Personal drive to succeed in your work and advance	①	②	③	④	⑤	⑥	⑦
i. Being honest, open, and truthful	①	②	③	④	⑤	⑥	⑦
j. Being disciplined and courageous in battle	①	②	③	④	⑤	⑥	⑦
k. Standing up for what you firmly believe is right	①	②	③	④	⑤	⑥	⑦
l. Working with others tactfully and with military courtesy	①	②	③	④	⑤	⑥	⑦
m. Exhibiting excellent military bearing and appearance	①	②	③	④	⑤	⑥	⑦
n. Equal opportunity regardless of gender	①	②	③	④	⑤	⑥	⑦
o. High moral standards both on-duty and off-duty	①	②	③	④	⑤	⑥	⑦
p. Building and maintaining physical fitness and stamina	①	②	③	④	⑤	⑥	⑦

14. **As you see it now, how well do your personal values match the values of the Army?**
- ○ Extremely well
- ○ Very well
- ○ Neither well nor poorly
- ○ Poorly
- ○ Not at all

15. **Suppose your immediate supervisor were to compare your performance to other soldiers in your unit. How would they rate your ... MARK ONE RESPONSE FOR EACH.**

	Truly exceptional (top 5%)	Outstanding (upper 15%)	Above average (upper 30%)	Average (middle 40%)	Below average (bottom 30%)
a. EFFORT (such as willingness to give your best effort and assist others to make sure the job gets done)	①	②	③	④	⑤
b. PERSONAL DISCIPLINE (such as willingness to follow Army regulations, orders, and Standard Operating Procedures, and display respect for superiors)	①	②	③	④	⑤
c. PHYSICAL FITNESS (effectively maintaining military standards of physical fitness)	①	②	③	④	⑤
d. OVERALL EFFECTIVENESS	①	②	③	④	⑤

16. **As you see it now, to what extent are you the type of individual that the Army wants as a soldier?**
- ○ Very great extent
- ○ Great extent
- ○ Moderate extent
- ○ Slight extent
- ○ Not at all

17 **Based on your Army experience, how satisfied or dissatisfied are you with the following? MARK ONE RESPONSE FOR EACH.**

	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
a. Amount of enjoyment from my job	1	2	3	4	5
b. Level of job fulfillment/challenge	1	2	3	4	5
c. Use of my skills and training on the job	1	2	3	4	5
d. Control over my job assignments	1	2	3	4	5
e. Geographic location of jobs	1	2	3	4	5
f. Level of fairness in how my performance is evaluated	1	2	3	4	5
g. Level of recognition for my accomplishments	1	2	3	4	5
h. Assignments to jobs offering technical/professional development	1	2	3	4	5
i. Opportunity to select a job, training, or station of my choice	1	2	3	4	5
j. Access to education/training	1	2	3	4	5
k. Overseas duty	1	2	3	4	5
l. Frequency of deployments	1	2	3	4	5
m. Quality of medical care	1	2	3	4	5
n. Availability of medical care	1	2	3	4	5
o. Quality of military recreation services	1	2	3	4	5
p. Availability of military recreation services	1	2	3	4	5
q. Quality of military family services	1	2	3	4	5
r. Availability of military family services	1	2	3	4	5

18. **During the last 12 months, how many WEEKS have you been away from your duty station for your military duties (including deployments, assignments, training, TDY)?**
- ○ Not been away at all
- ○ Less than 1 week

NUMBER OF WEEKS AWAY

0	0
1	1
2	2
3	3
4	4
5	5
	6
	7
	8
	9

19. **During the last 12 months, how many times have you been DEPLOYED?**
- ○ Not at all in the last 12 months
- ○ Once
- ○ Twice
- ○ Three or more times

20. **During the last 12 months, have you been DEPLOYED for any of the following reasons? MARK ALL THAT APPLY.**
- ○ Not applicable; I have not been deployed during the last 12 months
- ○ I have participated in a warfighting deployment
- ○ I have participated in a peacekeeping deployment
- ○ I have participated in a humanitarian assistance or disaster relief deployment
- ○ I have participated in a deployment for homeland defense

21. **Please indicate your level of agreement with the use of the Army for the following types of missions. MARK ONE RESPONSE FOR EACH.**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. Warfighting	1	2	3	4	5
b. Peacekeeping	1	2	3	4	5
c. Homeland defense	1	2	3	4	5
d. Humanitarian assistance/disaster relief	1	2	3	4	5

22. **At the present time, what level of strain, conflict, or stress–if any–are you experiencing?**
- ○ Very high
- ○ High
- ○ Moderate
- ○ Low
- ○ Very low
- ○ None

23. **How would you rate your current level of morale?**

- Very high
- High
- Moderate
- Low
- Very low

24. **Are you planning on going to college?**

- Yes, I am currently enrolled in college
- Yes, on active duty, later in this enlistment
- Yes, after I complete this term of duty
- No
- Undecided

25. **Did you contribute to the Montgomery GI Bill (MGIB)?**

- Yes
- No
- Do not know whether I contributed to the MGIB

26. **Will you have the Army College Fund (ACF) available to you when you leave the Army?**

- Yes
- No
- Do not know whether I will have the ACF available

27. **Assume you were to leave the Army in the next 6 months. Which of the following reasons would be likely to apply to your case? RESPOND TO EACH ITEM.**

	Unlikely to apply	Likely to apply
a. The expiration of my term of service (ETS)	①	②
b. Failure to meet minimum physical requirements	①	②
c. Family problems at home	①	②
d. Pregnancy	①	②
e. One or more serious (UCMJ) offenses	①	②
f. Minor offenses or disciplinary problems	①	②
g. Lack of motivation, boredom	①	②
h. Problems with supervisors	①	②
i. To enroll in college or a vocational training program	①	②
j. Better job opportunities outside the Army	①	②
k. Meeting weight standards	①	②
l. Drug/alcohol use	①	②
m. Mental health problems	①	②
n. Other medical problems	①	②

28. **Since completing training (AIT, OSUT), have you gotten into any serious trouble (e.g., UCMJ offenses, Article 15s, letters of reprimand)?**

- No
- Yes, just once
- Yes, two or three times
- Yes, four or more times

29. **Considering both your own qualifications and current labor market conditions, how difficult do you think it would be for you to find a good civilian job right now?**

- Very difficult
- Difficult
- Not particularly difficult or easy
- Easy
- Very easy

30. **From what you know about Army and civilian life, please indicate how you believe conditions in the military are compared with conditions in a civilian job you could realistically expect to get. MARK ONE RESPONSE FOR EACH.**

	Much better in Army	Somewhat better in Army	About the same in each	Somewhat better in civilian life	Much better in civilian life
a. Pay	①	②	③	④	⑤
b. Retirement benefits	①	②	③	④	⑤
c. Benefits other than retirement	①	②	③	④	⑤
d. Assistance for civilian education	①	②	③	④	⑤
e. Opportunities to advance in your chosen field	①	②	③	④	⑤
f. Opportunities for job satisfaction	①	②	③	④	⑤
g. Quality of co-workers	①	②	③	④	⑤
h. Work hours/schedule	①	②	③	④	⑤
i. Time for personal/family life	①	②	③	④	⑤
j. Overall quality of life	①	②	③	④	⑤
k. Level of integrity in the organization	①	②	③	④	⑤
l. Level of professionalism in the organization	①	②	③	④	⑤
m. Personal freedom	①	②	③	④	⑤
n. Job security	①	②	③	④	⑤
o. Total family income	①	②	③	④	⑤

31. **The kind of work I enjoy most is available . . .**
- Only in the military.
- Primarily in the military.
- Equally in the military and civilian world.
- Primarily in the civilian world.
- Only in the civilian world.
- Don't know.

32. **What effect, if any, have your Army experiences had on the development of specific job knowledge, skills, and abilities that will help you perform a civilian job?**
- Extremely positive effect
- Very positive effect
- Little effect
- No effect
- Don't know

33. **What effect, if any, have your Army experiences had on the development of personal characteristics and attitudes that will help you perform a civilian job?**
- Strong positive effect
- Positive effect
- No effect
- Negative effect
- Strong negative effect
- No basis to judge

34. **How supportive/unsupportive is your spouse/girlfriend/boyfriend of your completing your obligated term of service in the Army?**
- Does not apply; I do not have a spouse/ girlfriend/boyfriend
- Very supportive
- Fairly supportive
- Mixed or neutral
- Fairly unsupportive
- Very unsupportive

35. **The people most important to me would be extremely disappointed if I dropped out of the Army before completing my enlistment obligation.**
- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

36. **How supportive/unsupportive are the people most important to you of your re-enlisting in the Army?**
- Very supportive
- Fairly supportive
- Mixed or neutral
- Fairly unsupportive
- Very unsupportive

37. **How supportive/unsupportive is the leadership in your unit of your re-enlisting in the Army?**
- Very supportive
- Fairly supportive
- Mixed or neutral
- Fairly unsupportive
- Very unsupportive

38. **How many months do you have remaining on your current term of enlistment in the Army?**
- Less than 3 months
- Between 3 months and 6 months
- Between 6 months and 9 months
- Between 9 months and 1 year
- More than 1 year

39. **How IMPORTANT to you is it that you complete your current enlistment obligation?**
- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

40. **On the average, about how many hours do you work on a TYPICAL/AVERAGE duty day? (Include all activities required for your duty, i.e., PT, etc.)**

HOURS PER DAY ⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯+

41. **On the average, about how many hours do you work in a TYPICAL/AVERAGE week?**

HOURS PER WEEK ⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

42. **How satisfied are you with the help the Army provides for finding a civilian job after separation from the Army?**
- Do not know what help the Army provides
- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

43. **How satisfied are you with the support and concern the Army has for your family?**
- Does not apply; I do not have dependent family members
- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

44. **Which ONE of the following best describes your current active duty Army career intentions? MARK ONE.**

- DEFINITELY stay until retirement
- PROBABLY stay until retirement
- DEFINITELY stay beyond my present obligation, but not necessarily until retirement
- PROBABLY stay beyond my present obligation, but not necessarily until retirement
- PROBABLY leave after my present obligation
- DEFINITELY leave after my present obligation

45. **How many years of active duty service do you expect to have completed by the time you leave the Army?**

- 2 years or less
- 3 years
- 4 years
- 5 - 9 years
- 10 - 14 years
- 15 - 19 years
- 20 - 24 years
- 25 - 29 years
- 30 or more years

46. **What is your current marital status?**

- Married
- Legally separated or filing for divorce
- Single, never married
- Single, engaged to be married
- Divorced
- Widowed

47. **How many dependent children do you have (for whom you provide financial support)?**

- None
- 1
- 2
- 3
- 4 or more

48. **In what month and year did you begin basic training?**

Month		
Year 19		

49. **Please write your Social Security Number in the boxes below and then fill in the appropriate circles in the grid.**

			-		-				
0	0	0		0	0	0	0	0	0
1	1	1		1	1	1	1	1	1
2	2	2		2	2	2	2	2	2
3	3	3		3	3	3	3	3	3
4	4	4		4	4	4	4	4	4
5	5	6		5	5	5	5	5	5
6	6	6		6	6	6	6	6	6
7	7	7		7	7	7	7	7	7
8	8	8		8	8	8	8	8	8
9	9	9		9	9	9	9	9	9

THANK YOU FOR YOUR ASSISTANCE. Please place the completed questionnaire in the envelope provided, seal the envelope, and return it to your unit point-of-contact. The envelope is provided to help protect your privacy.

ADDITIONAL COMMENTS

If you would like to make any comments on the topics of this survey or any other Army topics of interest to you and your family members, please write them in the space below.

If applicable, please indicate the question number to which your comment is related.

SOLDIER EXIT SURVEY

SURVEY APPROVAL AUTHORITY: U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
SURVEY CONTROL NUMBER: PT 60-18B

The **Soldier Exit Survey** is part of a research project to evaluate the attitudes and experiences of enlisted personnel during their careers in the United States Army. In this project, the U.S. Army Research Institute (ARI) will assess the expectations and impressions of new recruits, soldiers completing training, and personnel exiting the Army. The project covers a wide range of issues related to soldiers' jobs, careers, and the Army as a whole. The overall purpose is to provide senior Army leaders information for recruiting, training, and retaining a high quality force of soliders.

Thank you for your support for this survey program.

PRIVACY ACT STATEMENT

1. The Department of the Army may collect the information requested in this survey under the authority of 10 United States Code 2358. Providing information in this questionnaire is voluntary. Failure to respond to any specific question will not result in any penalty.

2. Public Law 93-573 (Privacy Act of 1974) requires that you be informed of the purpose and uses to be made of the information collected. The information collected in the survey will be used solely for research purposes. Your Social Security Number (SSN) is requested only for linking data files. Use of SSNs is authorized by Executive Order 9397. In accordance with federal regulations, the survey data will be safeguarded to protect your privacy. After we have used your SSN to create the data files, a new identification code will be created to replace your SSN. The file linking your SSN to the new ID code will be properly secured to preserve confidentiality. Only survey statisticians involved in collecting or preparing the information for analysis will have access to completed questionnaires. Only group statistics will be reported.

How to fill out this survey.

Read each question carefully and mark your answers directly on this form.

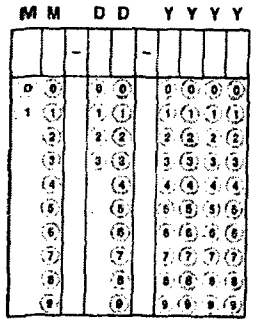
MARKING INSTRUCTIONS

- **Please use a No. 2 pencil.**
- **Please completely fill in the response as shown in example:**

1. How did Army life compare with your expectations?

- ○ Much better than I expected
- ○ Somewhat better than I expected
- ● About the same as I expected
- ○ Somewhat worse than I expected
- ○ Much worse than I expected

1. **Enter today's date (MM/DD/YYYY):**



2. **How did Army life compare with your expectations?**
   - Much better than I expected
   - Somewhat better than I expected
   - About the same as I expected
   - Somewhat worse than I expected
   - Much worse than I expected

3. **Overall, how SATISFIED were you with the following elements of your Army experience?**

	Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied	Not Applicable
a. Your recruiter	1	2	3	4	5	6
b. Delayed Entry Program (DEP)	1	2	3	4	5	6
c. Military Entrance Processing Station (MEPS)	1	2	3	4	5	6
d. Reception Station	1	2	3	4	5	6
e. Basic Training/OSUT	1	2	3	4	5	6
f. Drill Sergeant	1	2	3	4	5	6
g. Advanced Individual Training	1	2	3	4	5	6
h. MOS/Duty Assignment	1	2	3	4	5	6

4. **How does your health compare now to what it was when you first entered the Army?**
   - Much better now
   - Somewhat better now
   - About the same as it was
   - Somewhat worse now
   - Much worse now

5. **To what extent was each of the following a reason for your leaving the Army?**

	Not At All	Slight Extent	Moderate Extent	Great Extent	Very Great Extent
a. Failure to meet physical requirements	1	2	3	4	5
b. Problems adjusting to Army life	1	2	3	4	5
c. Family problems at home	1	2	3	4	5
d. Pregnancy	1	2	3	4	5
e. One or more serious (UCMJ) offenses	1	2	3	4	5
f. Minor offenses or disciplinary problems	1	2	3	4	5
g. Poor academic performance	1	2	3	4	5
h. Illness/medical condition	1	2	3	4	5
i. Homesickness	1	2	3	4	5
j. Lack of motivation, boredom	1	2	3	4	5
k. Problems with supervisors	1	2	3	4	5
l. Racial discrimination	1	2	3	4	5
m. Sexual or gender discrimination	1	2	3	4	5
n. Better job opportunities outside the Army	1	2	3	4	5
o. Injuries sustained during training	1	2	3	4	5
p. Not getting desired military job	1	2	3	4	5
q. Sexual harassment	1	2	3	4	5
r. Not getting along with others	1	2	3	4	5
s. Maintaining weight standards	1	2	3	4	5
t. Drug/alcohol abuse	1	2	3	4	5
u. Mental health problems	1	2	3	4	5
v. Unfair punishment	1	2	3	4	5
w. Verbal abuse from training staff members	1	2	3	4	5

6. **To what extent would each of the following have helped you complete your term of enlistment?**

	Not At All	Slight Extent	Moderate Extent	Great Extent	Very Great Extent
a. Obtain more complete and accurate prior service medical information	①	②	③	④	⑤
b. Improve counseling to soldiers having difficulty adjusting to Army life and discipline	①	②	③	④	⑤
c. Provide more realistic descriptions of Army life before entering the Army	①	②	③	④	⑤
d. Make physical fitness training prior to entering the Army more rigorous	①	②	③	④	⑤
e. Provide information to parents, guardians, or spouses on how to support trainees and lessen homesickness	①	②	③	④	⑤
f. Maintain fair standards for discipline, treatment, and privileges across all training units	①	②	③	④	⑤
g. Collect confidential feedback regularly from trainees about the performance of drill sergeants/ training instructors	①	②	③	④	⑤
h. Increase the amount of respect and consideration shown recruits	①	②	③	④	⑤
i. Provide more incentives or rewards for good performance for trainees	①	②	③	④	⑤
j. Make clear the full value of Army benefits and compensation	①	②	③	④	⑤

7. **How do you feel about leaving the Army before your current obligation is completed?**
   - ○ Very good
   - ○ Good
   - ○ Neither good nor bad
   - ○ Bad
   - ○ Very bad

8. **How satisfied are you with the training you have received since you entered the Army?**
   - ○ Very satisfied
   - ○ Satisfied
   - ○ Neither satisfied nor dissatisfied
   - ○ Dissatisfied
   - ○ Very dissatisfied

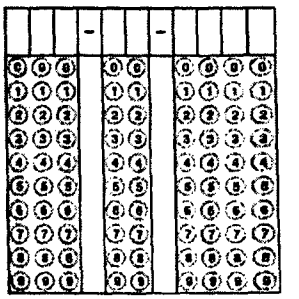
9. **What kind of discharge from the Army will you receive?**
   - ○ Honorable
   - ○ Under Honorable Conditions
   - ○ Other Than Honorable
   - ○ Bad Conduct
   - ○ Other – PLEASE SPECIFY: _____
   - ○ Don't know

10. **How will early release from the Army affect your ability to achieve your career goals?**
    - ○ Strong positive effect
    - ○ Positive effect
    - ○ No effect
    - ○ Negative effect
    - ○ Strong negative effect
    - ○ No basis to judge

11. **If a male asked your advice about joining the Army, would you recommend that he . . . (MARK ONE)**
    - ○ join the Army?
    - ○ join another military service?
    - ○ not join a military service?

12. **If a female asked your advice about joining the Army, would you recommend that she . . . (MARK ONE)**
    - ○ join the Army?
    - ○ join another military service?
    - ○ not join a military service?

13. **Enter your Social Security Number below.**



14. **In your own words, why are you leaving the Army?**

_____

_____

_____

_____

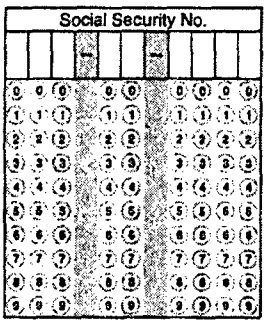
_____

_____

BCT Performance Record

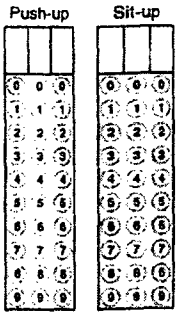
RED Phase

Part I Basic Data

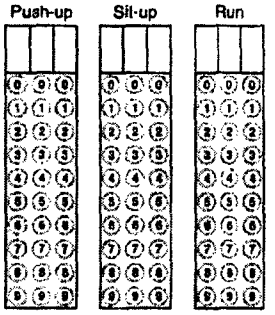


Part III Physical Fitness

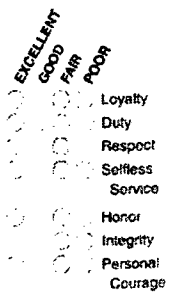
Diagnostic Army Physical Fitness Test 1 Soldier Score



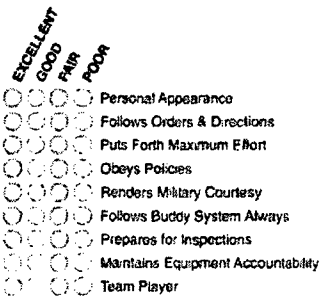
Diagnostic Army Physical Fitness Test 2 Soldier Score



Part IV Army Values



Part V Motivation & Discipline



Part VI RED Phase Completion Certification

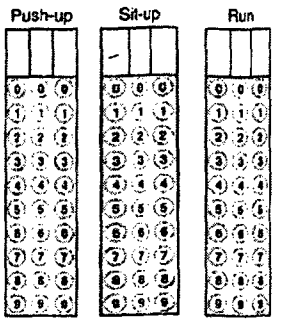
Soldier achieved standards to move to next phase

Yes ◯ No ◯ Marginal

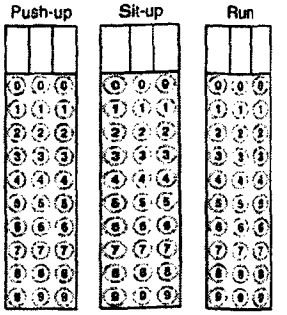
BLUE Phase

Part III Physical Fitness

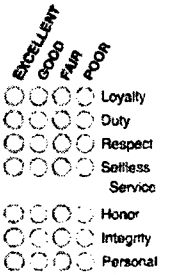
Record Army Physical Fitness Soldier Score



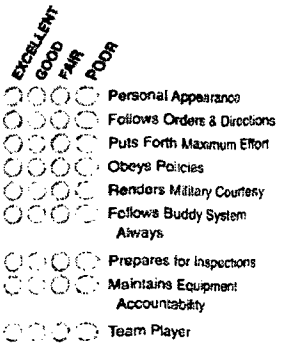
Army Physical Fitness Re-Test Soldier Score



Part IV Army Values



Part V Motivation & Discipline



Part VI BLUE Phase Graduation Certification

Soldier achieved graduation standards

◯ Yes ◯ No ◯ Marginal

R15135-PFI-54321

APPENDIX B: FREQUENCY OF MATCHING RECORDS ACROSS SURVEYS

Frequencies presented in Tables B.1 and B.2 are based on surveys returned. They do not reflect sample sizes for report analyses. Such sample sizes were specific to report chapters and depended upon what variables from the surveys were used.

Table B.1. Frequency of Pairwise Matches Across Surveys

Data Source	EMF	SRS	Red Phase Ratings	EOT-BCT	EOT-AIT	EOT-OSUT	AS01	ASO2	Exit Survey	Discharge Records
EMF	63,938									
SRS	29,004	.								
Red Phase Ratings	2,188	1,562	.							
EOT-BCT	22,015	11,834	1,043	.						
EOT-AIT	10,382	6,153	275	6,093	.					
EOT-OSUT	6,868	5,382	94	10	0	.				
AS01	16,026	7,716	702	5,757	3,005	2,607	.			
AS02	14,351	7,049	639	5,730	2,698	2,035	5,642	.		
Exit Survey	4,360	2,382	87	300	34	58	1	2	.	
Discharge Records	6,092	3,387	107	517	77	77	0	2	3,672	.
AIM Research DB	15,941	10,923	2	4,309	3,742	2,654	3,754	3,099	1,189	2,000

Note. Values below the diagonal represent the frequency of matching records between pairs of data sources (e.g., SRS with Red Phase, SRS with EOT-BCT, etc.).

Table B.2. Frequency of Combinatorial Matches Across Surveys

Database Combination	*n*	*n w/AIM*	*n w/ES*	*n w/DR*
SRS-Red	1,562	1	57	72
SRS-Red-BCT	769	0	4	6
SRS-Red-BCT-AIT	159	0	0	0
SRS-Red-BCT-AIT-AS01	53	0	0	0
SRS-Red-BCT-AIT-AS02	50	0	0	0
SRS-Red-BCT-AIT-AS01-AS02	20	0	0	0
SRS-BCT	11,834	3,921	191	333
SRS-BCT-AIT	3,961	1,754	7	22
SRS-BCT-AIT-AS01	1,076	453	0	0
SRS-BCT-AIT-AS02	1,034	418	0	0
SRS-BCT-AIT-AS01-AS02	338	145	0	0
SRS-AIT	6,153	3,002	20	42
SRS-AIT-AS01	1,804	853	0	0
SRS-AIT-AS02	1,628	735	0	0
SRS-AIT-AS01-AS02	1,602	292	0	0
BCT-AIT	6,093	1,957	12	45
BCT-AIT-AS01	1,651	499	0	0
BCT-AIT-AS02	1,572	474	0	0
BCT-AIT-AS01-AS02	543	269	0	0
AIT-AS01	3,005	1,052	0	0
AIT-AS02	2,698	927	0	
AIT-AS01-AS02	1,015	368	0	0
SRS-Red	1,562	1	57	72
SRS-Red-OSUT	75	0	0	0
SRS-Red-OSUT-AS01	34	0	0	0
SRS-Red-OSUT-AS02	31	0	0	0
SRS-Red-OSUT-AS01-AS02	19	0	0	0
SRS-OSUT	5,382	2,218	47	60
SRS-OSUT-AS01	2,087	769	0	0
SRS-OSUT-AS02	1,634	545	0	0
SRS-OSUT-AS01-AS02	792	251	0	0
OSUT-AS01	2,607	890	0	0
OSUT-AS02	2,035	650	0	0
OSUT-AS01-AS02	980	295	0	0
AS01-AS02	5,642	1,269	0	0

Note. Values indicate the frequency of matching records among the data sources listed. *n* w/AIM = Number of records in the given survey combination that have matching AIM data. *n* w/ES = Number of records in the given survey combination that have matching Exit Survey data. *n* w/DR = Number of records in the given survey combination that have matching Discharge Record data.

APPENDIX C: AIT AND OSUT TRAINING LENGTHS

Table C.1. AIT Lengths (in days) for Non-OSUT MOS

MOS	Days	MOS	Days	MOS	Days	MOS	Days	MOS	Days	MOS	Days
00B	251	15J	206	35B	134	52E	203	68X	149	91K	364
02B	161	15N	150	35C	140	52G	63	68Y	182	91M	49
02C	161	15P	42	35D	239	55B	72	71D	73	91P	322
02D	161	15Q	98	35E	185	55D	266	71G	45	91Q	133
02E	161	15R	102	35F	157	57E	35	71L	56	91R	56
02F	161	15S	88	35H	233	62B	58	71M	49	91S	105
02G	161	15T	101	35J	101	62E	58	73C	49	91T	63
02H	161	15U	112	35L	164	62F	45	73D	56	91V	252
02J	161	15X	149	35M	312	62G	42	74B	121	91X	137
02K	161	15Y	182	35N	115	62H	35	74C	63	92A	84
02L	161	21D	251	35Q	135	62J	46	74G	121	92F	60
02M	161	21E	58	35R	197	63A	112	75B	59	92G	58
02N	161	21F	45	35Y	232	63B	70	75F	56	92L	67
02S	161	21J	46	37F	98	63D	57	75H	59	92M	44
02T	161	21K	36	38A	65	63E	95	76J	38	92R	112
02U	161	21L	126	39B	268	63G	63	77F	60	92S	51
13C	23	21M	92	42A	59	63H	98	77L	67	92W	74
13D	50	21R	45	42E	31	63J	77	77W	74	92Y	52
13E	53	21S	102	42F	56	63M	99	79R	63	93C	98
13F	50	21T	129	42L	35	63S	63	81L	126	93F	67
13M	29	21U	126	43M	44	63T	86	81T	126	93P	42
13P	49	21V	35	44B	87	63W	81	82C	50	96B	115
13R	72	21W	51	44E	94	63Y	85	82D	102	96D	142
13S	50	25M	92	45B	86	67N	70	88H	56	96H	137
13W	67	25R	189	45D	58	67R	102	88K	42	96R	39
13X	53	25V	194	45E	73	67S	88	88L	57	96U	164
14E	238	27D	73	45G	177	67T	101	88M	42	97B	126
14J	133	27E	168	45K	128	67U	112	88N	43	97E	105
14L	134	27M	164	45T	72	67V	63	88P	35	97L	14
14M	44	27T	136	46Q	84	67Y	81	88T	35	98C	122
14R	87	31C	67	46R	84	68B	123	88U	35	98H	150
14S	70	31F	122	51B	51	68D	122	89D	266	98J	77
14T	77	31L	50	51K	36	68F	129	91A	287	98K	137
15B	123	31P	191	51M	92	68G	100	91D	133		
15D	122	31R	94	51R	45	68H	78	91E	49		
15F	129	31S	274	51T	129	68J	136	91G	45		
15G	100	31U	137	52C	87	68N	150	91H	168		
15H	71	33W	288	52D	81	68S	206	91J	38		

Note. Source Department of the Army Pamphlet (DA PAM) 611-21. Estimates do not include days in basic combat training.

Table C.2. OSUT Lengths (in days) for OSUT MOS

MOS	Days
11B	101
11C	101
11H	101
11M	115
11X	101
12B	101
12C	101
13B	102
19D	119
19K	112
21B	101
21C	101
31B	118
31E	119
54B	135
74D	135
95B	118
95C	119

Note. Source DA PAM 611-21.

APPENDIX D: PRE-TRAINING PREDICTOR VARIABLES EXAMINED IN ATTRITION CHAPTERS

Table D.1. Pre-Training Predictor Variables Examined in Chapter 3

Administrative (k =23)

- AFQT Category at Entry
- Career Management Field (CMF) Category (Non-OSUT Models Only)
- Center for Disease Control (CDC) Body Mass Index (BMI) Category
- Education Tier at Entry
- Enlistment Bonus Option
- Enlistment Term at Entry
- Enlistment Waiver
- High Quality Recruit (High School Diploma Graduate + AFQT Cat I-IIIa)
- Marital Status at Entry (Single v. Married)
- Medical Failure: Cardiovascular (Lungs, Heart, Vascular, BP, EKG, Pulse)
- Medical Failure: Drugs
- Medical Failure: Other
- Medical Failure: Physical Extremities (Upper, Lower, Feet, Spine)
- Medical Failure: Weight
- Medical/Physical Enlistment Waiver
- Moral Character Enlistment Waiver
- MOS (OSUT Models Only)
- MOS Classification (CA, CS, CSS) (Non-OSUT Models Only)
- Number of Dependents at Entry
- Pay Grade at Entry
- Race/Ethnicity (W/B/H/Other)
- Gender
- Youth Program Participation

SRS Single Items (k =44)

- 01a. Army advertising
- 01b. Army recruiter
- 01c. Desire to serve my country
- 01m. Military tradition in family
- 01s. Repayment of loans
- 01u. Make Army a career
- 02a. Parent(s)/Guardian(s)
- 02b. Brother/Sister
- 02c. Friend(s)
- 02d. Wife/Husband/Girlfriend/Boyfriend
- 02e. Athletic Coach
- 02f. Teacher
- 02g. School Guidance Counselor
- 02h. ROTC student
- 02i. ROTC cadre member
- 02j. Service member

Table D.1. (continued)

02k. Recruiter
02l. Radio advertisement
02m. Television advertisement
02n. Printed advertisement
04. Expected of you in the Army
05. How long in DEP
11. Parent career active military
20. Average grades in high school
21. College when enlistment term is up
22a. Never sent to principal's office
23. Were you ever expelled
24. Were you ever suspended
25a. Never thought about quitting HS
35. Average fitness level before Army
36. # Serious injuries before Army
37. Medical advice against exercise
38a. Haven't had job outside the home
39. Moral waiver needed to join Army
40. Medical waiver needed to join Army
42. How often smoke before DEP
43. How often drink alcohol before DEP
47. Work I enjoy most is available
48. Difficult to find good civilian job
52. Advise male about joining Army
53. Advise female about joining Army
54a. Don't have any uncertainty
58. Level of stress/strain
59. Current level of morale
57g. Illness/medical condition
57m. Better job outside the Army
57n. Injuries during training
57o. Not getting desired military job

SRS Composites (k=27)

Affective Commitment
Attrition Cognitions
Continuance Commitment
Continuance Intentions
Generalized Self Efficacy
Core Army Values- Duty, Integrity, Courage
Core Army Values- Loyalty, Selfless Service
Military vs. Civilian Life - Overall
Military vs. Civilian Life - Pay
Military vs. Civilian Life - Quality of Work Life
Military vs. Civilian Life - Time for Personal Life
Participation in DEP Activities

Table D.1. (continued)

Participation in High School Activities
Reasons for Joining Army - Escape Problems
Reasons for Joining Army - Family/Friends Influence
Reasons for Joining Army - Job Benefits
Reasons for Joining Army - Opportunity to Travel
Reasons for Joining Army - Personal Growth
Reasons for Joining Army - Training and Experience
Reasons for Leaving Army - All Reasons
Reasons for Leaving Army - Deviance
Reasons for Leaving Army - Discrimination
Reasons for Leaving Army - Problems Adjusting
Reasons for Quitting Previous Jobs
Thoughts of Quitting High School
Trouble in School
Unsure about Army Career

APPENDIX E: CORRELATIONS BETWEEN PRE-TRAINING VARIABLES AND ATTRITION IN THE OVERALL SAMPLE

Note, for each table in this appendix: r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r and c-statistics are significant ($p < .05$). Within each category, predictors are sorted in descending order by value of their correlation with the given type of attrition.

Table E.1. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Moral Character Attrition

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Education Tier	45,196	.14	.566	.004
Pay Grade at Entry	45,381	.09	.559	.004
High Quality Recruit	45,381	.09	.559	.004
CMF Category	45,374	.07	.553	.004
Race/Ethnicity	45,381	.06	.538	.004
Gender	45,381	.06	.530	.004
Enlistment Waiver	45,381	.06	.517	.004
AFQT Category	45,293	.06	.542	.004
Medical Failure: Drugs	45,381	.06	.509	.004
MOS Category (CA, CS, CSS)	45,381	.05	.539	.004
Enlistment Term at Entry	45,232	.05	.517	.004
Moral Character Enlistment Waiver	45,381	.05	.513	.004
SRS Single Items				
42. How often smoke before DEP	21,063	.16	.611	.006
24. Were you ever suspended	17,638	.14	.604	.006
23. Were you ever expelled	17,635	.11	.537	.007
43. How often drink alcohol before DEP	21,046	.07	.549	.006
02d. Wife/Husband/Girlfriend/Boyfriend	20,179	.05	.529	.006
02a. Parent(s)/Guardian(s)	20,179	.05	.537	.006
39. Moral waiver needed to join Army	21,033	.05	.518	.006
21. College when enlistment term is up	20,728	-.05	.530	.006
20. Average grades in high school	20,952	-.08	.562	.006
05. How long in DEP	20,913	-.09	.571	.006
22a. Never sent to principal's office	20,737	-.11	.575	.005
25a. Never thought about quitting HS	20,690	-.15	.592	.006
SRS and AIM Composites				
SRS Trouble in School	20,737	.17	.626	.006
SRS Thoughts of Quitting High School	20,690	.14	.597	.006
SRS Reasons for Joining Army - Escape Problems	21,032	.07	.554	.006
SRS Reasons for Quitting Previous Jobs	20,934	.07	.551	.006
SRS Military vs. Civilian- Pay	20,708	.05	.540	.006
AIM Adjustment	11,090	-.05	.534	.007
AIM Physical Condition	11,102	-.06	.545	.007
AIM Work Orientation	11,093	-.07	.548	.007
AIM Agreeableness	11,098	-.08	.559	.007
AIM Dependability	11,085	-.15	.605	.007

Table E.2. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Performance Attrition

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Gender	44,042	.15	.588	.004
Education Tier	43,899	.09	.541	.004
Pay Grade at Entry	44,042	.07	.549	.004
Race/Ethnicity	44,042	.06	.546	.004
High Quality Recruit	44,042	.06	.542	.004
CMF Category	44,035	.05	.539	.004
SRS Single Items				
42. How often smoke before DEP	20,200	.09	.569	.007
23. Were you ever expelled	16,971	.06	.521	.007
02d. Wife/Husband/Girlfriend/Boyfriend	19,380	.05	.528	.007
47. Work I enjoy most is available	20,178	-.05	.537	.007
53. Advise female about joining Army	20,114	-.05	.534	.007
59. Current level of morale	20,204	-.08	.553	.007
52. Advise male about joining Army	20,115	-.08	.540	.007
05. How long in DEP	20,049	-.09	.578	.006
35. Average fitness level before Army	20,232	-.11	.592	.006
25a. Never thought about quitting HS	19,838	-.12	.584	.007
SRS and AIM Composites				
SRS Attrition Cognitions	20,257	.15	.596	.007
SRS Thoughts of Quitting High School	19,838	.12	.589	.007
58. Level of stress/strain	20,200	.10	.593	.007
SRS Reasons for Leaving Army - Problems Adjusting	20,130	.10	.575	.007
SRS Trouble in School	19,848	.09	.564	.007
SRS Reasons for Leaving Army - All Reasons	20,214	.08	.575	.007
SRS Reasons for Leaving Army - Deviance	20,090	.05	.535	.007
SRS Reasons for Quitting Previous Jobs	20,077	.05	.538	.007
SRS Core Army Values - Duty, Integrity, Courage	20,232	-.06	.528	.007
SRS Core Army Values - Loyalty, Selfless Service	20,230	-.07	.545	.007
SRS Affective Commitment	20,239	-.08	.558	.007
AIM Work Orientation	10,442	-.09	.570	.008
AIM Dependability	10,434	-.10	.576	.008
AIM Agreeableness	10,449	-.10	.579	.008
AIM Adjustment	10,438	-.12	.587	.008
SRS Generalized Self Efficacy	20,238	-.13	.592	.007
AIM Physical Condition	10,455	-.15	.616	.008

Table E.3. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Medical/Physical Attrition

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Gender	43,983	.10	.555	.004
Race/Ethnicity	43,983	.09	.568	.004
CDC BMI Category	43,979	.08	.556	.004
Medical Failure: Weight	43,983	.06	.519	.004
Education Tier	43,842	.06	.528	.004
Pay Grade at Entry	43,983	.06	.539	.004
SRS Single Items				
58. Level of stress/strain	20,430	.10	.586	.006
42. How often smoke before DEP	20,421	.09	.564	.006
37. Medical advice against exercise	20,442	.07	.525	.006
36. # Serious injuries before Army	20,461	.06	.536	.006
40. Medical waiver needed to join Army	20,373	.05	.521	.006
52. Advise male about joining Army	20,342	-.05	.526	.006
59. Current level of morale	20,431	-.07	.546	.007
05. How long in DEP	20,263	-.08	.571	.006
25a. Never thought about quitting HS	20,073	-.09	.558	.006
35. Average fitness level before Army	20,449	-.11	.586	.006
SRS and AIM Composites				
SRS Attrition Cognitions	20,479	.14	.581	.007
SRS Thoughts of Quitting High School	20,073	.09	.562	.006
SRS Reasons for Quitting Previous Jobs	20,308	.09	.570	.006
SRS Reasons for Leaving Army - All Reasons	20,436	.08	.570	.006
SRS Reasons for Leaving Army - Problems Adjusting	20,360	.08	.555	.006
SRS Trouble in School	20,090	.06	.542	.006
SRS Affective Commitment	20,466	-.05	.536	.006
AIM Dependability	10,605	-.06	.539	.008
AIM Agreeableness	10,616	-.06	.546	.008
AIM Work Orientation	10,614	-.06	.547	.008
AIM Adjustment	10,608	-.10	.570	.008
AIM Physical Condition	10,622	-.12	.591	.008
SRS Generalized Self Efficacy	20,464	-.14	.587	.007

Table E.4. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Pregnancy/Parenthood Attrition

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Gender	40,208	.40	.887	.004
CMF Category	40,202	.14	.695	.006
MOS Category (CA, CS, CSS)	40,208	.12	.660	.006
Enlistment Term at Entry	40,080	.09	.624	.007
CDC BMI Category	40,204	.06	.575	.007
Marital Status at Entry	40,208	.06	.550	.008
Number of Dependents at Entry	40,208	.06	.549	.008
SRS Single Items				
20. Average grades in high school	18,514	.06	.588	.011
02d. Wife/Husband/Girlfriend/Boyfriend	17,859	.06	.561	.012
22a. Never sent to principal's office	18,285	.05	.565	.012
35. Average fitness level before Army	18,636	-.08	.606	.011
SRS and AIM Composites				
AIM Dominance	9,290	.06	.594	.017
SRS Military vs. Civilian- Pay	18,288	.06	.590	.011
SRS Participation in High School Activities	18,572	.05	.582	.011
AIM Dependability	9,278	.05	.572	.016
SRS Generalized Self Efficacy	18,643	-.05	.572	.012

Table E.5. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Other Attrition

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Education Tier	40,919	.07	.543	.006
Number of Dependents at Entry	41,054	.05	.535	.006
Gender	41,054	.05	.536	.006
Enlistment Term at Entry	40,916	.05	.547	.006
SRS Single Items				
42. How often smoke before DEP	19,067	.05	.550	.009
52. Advise male about joining Army	18,999	-.05	.530	.009
05. How long in DEP	18,922	-.06	.565	.009
25a. Never thought about quitting HS	18,730	-.08	.569	.009
SRS and AIM Composites				
SRS Thoughts of Quitting High School	18,730	.07	.571	.009
SRS Attrition Cognitions	19,123	.06	.542	.010
AIM Adjustment	9,664	-.05	.541	.012
SRS Generalized Self Efficacy	19,107	-.05	.537	.010
AIM Dependability	9,662	-.06	.564	.012

APPENDIX F: PARAMETERIZATION OF THE DISCRETE-TIME HAZARD MODEL FOR THE OVERALL SAMPLE

In this appendix we provide further detail on the parameterization of the discrete-time hazard model used in Chapter 3. The parameterization of the model used to test for the main effect (i.e., fixed across time) of any given predictor on attrition in the overall sample is shown in Equation F.1.

Equation F.1

$$h(t_{ij}) = \frac{1}{1 + e^{-[(\alpha_1 x_1 + \alpha_2 xi_{2_7} + \alpha_3 xs_{2_7} + \alpha_4 x_{8_16} + \alpha_5 x_{17_37} + \alpha_6 x_{38_48}) + (\beta p_i)]}}$$

In the above equation, $h(t_{ij})$ is the hazard (i.e., conditional probability of attrition) for Soldier i in month of service j. The α's are logistic regression coefficients for time variables and index average hazards for various months in service. Along with the time variables they are linked to, this set of α's represents the piecewise *parameterization of time* we adopted for the EHA models of overall attrition (as discussed in Chapter 3). The set of time variables linked to these α's were entered at Step 1 of the hierarchical EHA models. The time variables in this model are defined as follows:

- x_1 is a dummy variable (1 if the Soldier is in month of service 1, else 0)
- xi_{2_7} is a dummy variable (1 if the Soldier is in months 2 through 7, else 0)
- xs_{2_7} is a variable that is defined as follows: Month of service – 1 for Soldiers in months 2 through 7; else 0
- x_{8_16} is a dummy variable (1 if the Soldier is in months 8 through 16, else 0)
- x_{17_37} is a dummy variable (1 if the Soldier is in months 17 through 37, else 0)
- x_{38_48} is a dummy variable (1 if the Soldier is in months 38 through 48, else 0)

As evidenced above, the parameterization of time we used for the overall sample EHA models is a piecewise function. The function can be described as follows:

- A single dummy variable indexing the attrition rate in month of service 1.
- A downward linear trend for reflecting the drop in attrition between months 2 and 7 (see Figure 3.1). Such a trend requires an intercept and slope term (i.e., two parameters).
- A single dummy variable indexing the attrition rate in months of service 8 through 16 (i.e., attrition between months 8 and 16 was modeled as constant).
- A single dummy variable indexing the attrition rate in months of service 17 through 37 (i.e., attrition between months 17 and 37 was modeled as constant).
- A single dummy variable indexing the attrition rate in months of service 38 through 48 (i.e., attrition between months 38 and 48 was modeled as constant).

Comparing this parameterization of time to the hazard profile in Figure 3.1 clearly reveals its similarity. Comparing predicted hazards resulting from this piecewise parameterization to hazards for the completely general parameterization (which actually, is what is depicted in Figure 3.1) reveals that this relatively simple parameterization of time accurately reflects attrition rates over time.

The β in the Equation F.1 is the logistic regression coefficient for the given predictor variable of interest (p). p_i is Soldier i's score on predictor variable p. Predictor variable p was entered at Step 2 of the hierarchical model to assess its effect on attrition. It is important to note that the model shown in Equation F.1 treats the effect of predictor p on attrition as constant across time periods. The parameterization of the model that treated the effect of predictor p as time varying is shown below.

Equation F.2:

$$h(t_{ij}) = \frac{1}{1 + e^{-[(\alpha_1 x_1 + \alpha_2 xi_{2_7} + \alpha_3 xs_{2_7} + \alpha_4 x_{8_16} + \alpha_5 x_{17_37} + \alpha_6 x_{38_48}) + (\beta_1 p_i) + (\beta_2 p_i x_2 + \beta_3 p_i x_3 + \beta_4 p_i x_4 + \beta_5 p_i x_{5_7} + \beta_6 p_i x_{8_16} + \beta_7 p_i x_{17_37} + \beta_8 p_i x_{38_48})]}}$$

In this equation, the β's are defined as follows:

- β_1 is a logistic regression coefficient indexing the effect of predictor p on attrition in month of service 1.
- β_2 is a logistic regression coefficient indexing the effect of predictor p on attrition in month of service 2.
- β_3 is a logistic regression coefficient indexing the effect of predictor p on attrition in month of service 3.
- β_4 is a logistic regression coefficient indexing the effect of predictor p on attrition in month of service 4.
- β_5 is a logistic regression coefficient indexing the effect of predictor p on attrition in months of service 5 through 7.
- β_6 is a logistic regression coefficient indexing the effect of predictor p on attrition in months of service 8 through 16.
- β_7 is a logistic regression coefficient indexing the effect of predictor p on attrition in months of service 17 through 37.
- β_8 is a logistic regression coefficient indexing the effect of predictor p on attrition in months of service 38 through 48.

The cross-product interaction terms linked to βs 2 through 8 were entered at the third and final step of the hierarchical EHA model we fit for each predictor. New time variables involved in these interactions were defined as follows:

- x_2 is a dummy variable (1 if the Soldier is in month of service 1, else 0)
- x_3 is a dummy variable (1 if the Soldier is in month of service 1, else 0)
- x_4 is a dummy variable (1 if the Soldier is in month of service 1, else 0)
- xi_{5_7} is a dummy variable (1 if the Soldier is in months 5 through 7, else 0)
- x_{8_16} is a dummy variable (1 if the Soldier is in months 8 through 16, else 0)
- x_{17_37} is a dummy variable (1 if the Soldier is in months 17 through 37, else 0)
- x_{38_48} is a dummy variable (1 if the Soldier is in months 38 through 48, else 0)

APPENDIX G: MODEL FITTING ALGORITHM FOR MULTIVARIATE PREDICTION MODELS OF BCT AND OSUT ATTRITION

To construct the multivariate prediction models for each attrition criterion we:

1. Fitted all 118 analysis predictors listed in Table G.1 in a stepwise logistic regression model. Used backward elimination with a criterion for entering at $p < .05$ and a criterion for exiting at $p < .01$. Wald's criterion was used due to the large number of initial predictors.
   - Predictors included: (a) all SRS composites, (b) all administrative variables, (c) SRS single items that don't appear in composites, and (d) SRS single items that appear in highly heterogeneous composites (e.g., SRS Reasons for Quitting High School- All Reasons)
   - Due to high multicollinearity among several variables in this initial set, we used this step only as a gross means to identify a reduced set of variables to work with. For this reason, variables that were removed in this initial step would be revaluated in later steps.

2. Identified two reduced models from the above stepwise analysis that corresponded to: (a) the step when all predictors had significant betas at $p < .05$, (b) the step when all predictors had significant betas at $p < .01$.

3. Chose either the "$p < .05$" or "$p < .01$" reduced model from Step 2 to work with in subsequent iterations. Generally we aimed to have about 10-20 predictors in this working model.

4. Refitted the working model identified in Step 3 to the data. This was done to capitalize on additional cases made available by eliminating unused variables (the models identified in Step 1 were based on a listwise N for all 118 predictors). We eliminated predictors from the resulting model that had non-significant betas ($p < .05$).

5. Conducted an empirical residual search by calculating partial correlations between the attrition criterion (depending on the model, overall, medical, or performance attrition), and all dichotomous and continuous predictor variables not in the model resulting from Step 4 (the predicted probability of attrition resulting from the model in Step 4 was the variable that was partialled). These partial correlations helped identify which predictors might best add to the validity of the model.

6. Entered all predictors that had significant partial correlations in Step 5 ($p < .05$) in the second step of a hierarchical logistic regression model. The first step of this model contained the predictors used in the model resulting from Step 4. We eliminated variables from the resulting model until all betas were significant ($p < .05$) by:
   - First trimming those predictors in the second step of the model that had betas that were not significant (at $p = .15$) and then refitting the model.[1]
   - Next, trimming any remaining predictors that were not significant at $p < .05$.

[1] We chose a high p-value for this first step ($p = .15$) because we wanted to be careful not to eliminate any variable that might become significant at a lower p-value (e.g., $p = .05$) once the variables with the highest p-values were eliminated from the model.

7. Entered all surviving predictors resulting from Step 6 in the first step of a hierarchical logistic regression model. At the second step of this model, we entered all multi-category administrative variables.[2] We eliminated variables from the resulting model until all betas were significant ($p < .05$) using process bulleted under Step 6.

8. Conducted a second empirical residual search by calculating partial correlations between the attrition criterion and all dichotomous and continuous predictor variables not in the model resulting from Step 7. This time, the predicted probability of attrition resulting from the model in Step 7 was the variable being partialled.

9. Entered all predictors that had significant partial correlations in Step 8 ($p < .05$) in the second step of a hierarchical logistic regression model. The first step of this model contained the predictors used in the model resulting from Step 7. When entering predictors at the second step, we used backward elimination with a criterion for entering at $p < .05$ and a criterion for exiting at $p < .01$. Upon eliminating non-significant predictors in the second step, the resulting model was refitted to the data and any remaining predictors with non-significant betas were eliminated ($p < .05$). The model resulting from Step 9 served as the final predictive model for a given attrition criterion.

10. Once predictors for the final model were identified, a final logistic regression analysis was conducted to identify the change in model deviance (i.e., -2 log likelihood (LL) statistic) associated with the elimination of each predictor in the final model. This change in likelihood (denoted as Δ –2LL in report tables) provides a rough index of the relative importance of predictors to the fit of the final model.

For overall attrition criteria in the BCT (Ch. 4) and OSUT (Ch. 6) chapters, two types of final predictive models were presented, one that allowed Gender, race, and MOS variables to enter the model (Final Model A) and one that did not (Final Model B). The algorithm above described how Final Model A was formed for each criterion. The same strategy was used for forming Final Model B with the following exceptions:

- Gender, race, and MOS-variables (including variables that distinguished between career management field [CMF], and global MOS classifications [e.g., Combat Arms, Combat Support]) were not considered in any model.
- When calculating the partial correlations in Steps 5 and 8, both Gender *and* the predicted probabilities from the given attrition model were partialled. We partialled Gender to reduce the probability that additional predictors would enter the model simply because they were acting as proxies for Gender.

[2] Multi-category administrative variables were examined in this step as an alternative to the empirical residual analyses conducted in Step 5 (i.e., because correlations between multi-category variables such as race and the outcome of attrition would be meaningless). The purpose for examining the administrative variables at this step was to identify which of these variables could potentially increment the validity of the working model.

Table G.1. Variables Considered in BCT and OSUT Multivariate Predictive Models

Administrative (k =23)

- AFQT Category at Entry
- Career Management Field Category (Non-OSUT Models Only)
- Center for Disease Control (CDC) Body Mass Index (BMI) Category
- Education Tier at Entry
- Enlistment Bonus Option
- Enlistment Term at Entry
- Enlistment Waiver
- High Quality Recruit (High School Diploma Graduate + AFQT Cat I-IIIa)
- Marital Status at Entry (S/M)
- Medical Failure: Cardiovascular (Lungs, Heart, Vascular, BP, EKG, Pulse)
- Medical Failure: Drugs
- Medical Failure: Other
- Medical Failure: Physical Extremities (Upper, Lower, Feet, Spine)
- Medical Failure: Weight
- Medical/Physical Enlistment Waiver
- Moral Character Enlistment Waiver
- MOS (OSUT Models Only)
- MOS Classification (Non-OSUT Models Only)
- Number of Dependents at Entry
- Pay Grade at Entry
- Race/Ethnicity (W/B/H/Other)
- Gender
- Youth Program Participation

SRS Single Items (k =44)

- 01a. Army advertising
- 01b. Army recruiter
- 01c. Desire to serve my country
- 01m. Military tradition in family
- 01s. Repayment of loans
- 01u. Make Army a career
- 02a. Parent(s)/Guardian(s)
- 02b. Brother/Sister
- 02c. Friend(s)
- 02d. Wife/Husband/Girlfriend/Boyfriend
- 02e. Athletic Coach
- 02f. Teacher
- 02g. School Guidance Counselor
- 02h. ROTC student
- 02i. ROTC cadre member
- 02j. Service member
- 02k. Recruiter
- 02l. Radio advertisement
- 02m. Television advertisement
- 02n. Printed advertisement
- 04. Expected of you in the Army

Table G.1. (continued)

05. How long in DEP
11. Parent career active military
20. Average grades in high school
21. College when enlistment term is up
22a. Never sent to principal's office
23. Were you ever expelled
24. Were you ever suspended
25a. Never thought about quitting HS
35. Average fitness level before Army
36. # serious injuries before Army
37. Medical advice against exercise
38a. Haven't had job outside the home
39. Moral waiver needed to join Army
40. Medical waiver needed to join Army
42. How often smoke before DEP
43. How often drink alcohol before DEP
47. Work I enjoy most is available
48. Difficult to find good civilian job
52. Advise male about joining Army
53. Advise female about joining Army
54a. Don't have any uncertainty
58. Level of stress/strain
59. Current level of morale

SRS Composite Items (k=25)

25b. Family need
25c. Expelled or suspended
25d. Bored, not learning anything
25e. Got married or became a parent
25f. Getting bad grades
25g. Didn't get along with students
25h. The rules were too strict
25i. Wasn't going to graduate on time
25j. Didn't get along with authorities
25k. Wanted to work full time
25l. Other reasons
26a. Participated in Athletic teams
26b. Participated in Drama, music, art
38e. Left job-fired
38h. Left job-conflict with supervisor
38i. Left job-arrested
38l. Left job to join the military
57a. Fail physical requirements
57c. Family problems at home
57d. Pregnancy
57f. Poor academic performance

Table G.1. (continued)

57g. Illness/medical condition
57m. Better job outside the Army
57n. Injuries during training
57o. Not getting desired military job

SRS Composites (k=27)

Affective Commitment
Attrition Cognitions
Continuance Commitment
Continuance Intentions
Generalized Self Efficacy
Core Army Values- Duty, Integrity, Courage
Core Army Values- Loyalty, Selfless Service
Military vs. Civilian Life - Overall
Military vs. Civilian Life - Pay
Military vs. Civilian Life - Quality of Work Life
Military vs. Civilian Life - Time for Personal Life
Participation in DEP Activities
Participation in High School Activities
Reasons for Joining Army - Escape Problems
Reasons for Joining Army - Family/Friends Influence
Reasons for Joining Army - Job Benefits
Reasons for Joining Army - Opportunity to Travel
Reasons for Joining Army - Personal Growth
Reasons for Joining Army - Training and Experience
Reasons for Leaving Army - All Reasons
Reasons for Leaving Army - Deviance
Reasons for Leaving Army - Discrimination
Reasons for Leaving Army - Problems Adjusting
Reasons for Quitting Previous Jobs
Thoughts of Quitting High School
Trouble in School
Unsure about Army Career

APPENDIX H: NEW VARIABLES FOR STRUCTURAL MODELS OF BCT AND OSUT ATTRITION

A review of the research database and findings presented in Chapter 3 revealed that several existing SRS and administrative variables might serve as meaningful indicators of the new variables we desired to include in the structural models. However, in attempting to aggregate these variables into higher-order composites, we found that only Positive Army Affect (α = .73), Perceived Utility/Ease of Withdrawal (α = .69), and Core Army Values (α = .79) exhibited sufficient levels of internal consistency to consider variables comprising them as *reflective* measures of these constructs (Edwards & Bagozzi, 2000). The composition of these latter composites is described below.

Positive Army Affect

The Positive Army Affect composite consisted of six existing SRS variables: Affective Commitment, Continuance Intentions, and Items 47 (Work I enjoy is most available in military), 52 (Recommend Army to male), 53 (Recommend Army to female), and 59 (Current level of morale). This composite reflects Soldiers' degree of positive affect toward the Army immediately prior to entering training (i.e., feeling attached and good about the Army). The coefficient alpha for this composite was .73.

Perceived Utility/Ease of Withdrawal

The Perceived Utility/Ease of Withdrawal composite consisted of five existing SRS variables: Military vs. Civilian Life - Quality of Work Life, Military vs. Civilian Life - Time for Personal Life, Military vs. Civilian Life – Pay, Continuance Commitment, and Item 48 (Difficult to find a good civilian job). For purposes of forming this composite, each of these variables was first reverse-scored. The coefficient alpha for this composite was .69.

Core Army Values

The Core Army Values composite consisted of three existing SRS variables: Importance of Core Army Values - Loyalty and Selfless Service, Importance of Core Army Values - Duty, Integrity, and Personal Courage, and Item 01c (Joined Army out of desire to serve country). The coefficient alpha for this composite was .79.

For the other new variables in the preliminary structural model (i.e., Fitness, Medical, Past Withdrawal Propensity, and Deviant), we found that the SRS and administrative variables hypothesized to indicate Soldiers' standing on these constructs were not only quite heterogeneous (i.e., had low intercorrelations) but in some cases, multi-dimensional. For example, two Medical components and four Deviant components emerged from principal components analyses of medical and deviance-related items. The heterogeneous nature of the items underlying each of these proposed new variables yielded low levels of internal consistency when attempts were made to combine them. In spite of their heterogeneity however, we believed the available variables were indicative of Soldier's standing on these factors, and as such we conducted principal component analyses (PCA) to generate component scores based on them.

For example, PCA allowed us to capture the variance in multiple items that we believed were indicative of the Medical problems with far fewer components. This alleviated the need to distinguish which of numerous medical-related items would be most appropriate to include in the structural models. This approach addressed both modeling and practical concerns. Given the approach to forming these composites via PCA, one might refer to the variables underlying them as *formative* measures of the given constructs, rather than *reflective* measures, since the intercorrelations among variables comprising each component are relatively low (Edwards & Bagozzi, 2000). The composition of these components is described below.

Fitness

In the SRS, respondents were asked to evaluate several items (i.e., 26a, 35, 57a) related to physical fitness. Principal components analysis revealed that one factor accounted for 52.3% of the variance in these variables. Loadings for each variable entering into this component were .80 for Item 35 (Average fitness level before Army), .71 for Item 26a (Participate in high school athletics), and .65 for Item 57a (Potentially leave Army for failure to meet physical requirements- reverse scored).

Examining correlations between the Fitness component and fitness-related variables from other surveys (where available for a subset of Soldiers) provided construct validity evidence for the component. Namely, Fitness was significantly correlated with AIM Physical Conditioning (r = .55) as well as 1st and 2nd Army Physical Fitness Test (APFT) scores obtained from the Red Phase survey (r = .43 and .39, respectively).

Medical

In the SRS, respondents were asked several questions (i.e., 36, 37, 40, 57g) related to medical issues. Furthermore there were a few administrative variables (e.g., Medical failures) that also tapped into recruits' past medical histories. Principal components analysis revealed that two factors accounted for 43.2% of the variance in these variables. Loadings for each variable entering into these components are shown in Table H.1. The first component consisted of items that reflected medical problems formally recognized by the Army (i.e., through medical enlistment waivers or medical failure codes). For the analyses, we refer to this component as Medical I: Medical Waiver/Failure. The second component consisted of items that dealt more with recruits' self-reported medical history and concerns surrounding it. For the analyses, we refer to this component as Medical II: Medical History Concerns. Both of these factors demonstrated adequate discriminant validity, correlating only .07 with each other, -.03 with the Fitness component, and having near zero correlations with Red Phase APFT scores. Such findings suggest that medical and physical fitness predictors, though sometimes combined, may best be considered separately.

Table H.1. Loading for Variables Entering Medical Components

Variable	Component I	Component II
SRS 40:Medical waiver needed to join Army	**.87**	.06
Medical Failure: Other	**.61**	-.07
Medical Failure: Cardiovascular (Lungs, Heart, Vascular, BP, EKG, Pulse)	**.50**	-.09
Medical Failure: Physical Extremities (Upper, Lower, Feet, Spine)	**.46**	.14
SRS 36: # of Serious injuries before Army	.00	**.77**
SRS 37: Medical advice against exercise	-.02	**.75**
SRS 57g: Potentially leave Army due to illness/medical condition	.01	**.47**

Note. Based on principal components analysis with oblique rotation. The most salient loadings on each component are bolded.

Past Withdrawal Propensity

In the SRS, respondents were asked to evaluate several items relating to past propensity to withdraw or quit and these variables were subsequently made into composites (i.e., SRS Thoughts of Quitting High School, SRS Reasons for Quitting Previous Jobs, q.v., Chapter 2). Additionally, the SRS also asked about how long Soldiers were in DEP, which we felt reflected the positive pole of past withdrawal propensity, namely past completion propensity. Specifically, the longer a recruit "stuck it out" in DEP, the more likely they might be to "stick it out" upon entering the Army.[3] Furthermore we hypothesized that the reason education tier may be so predictive of attrition is that it reflects a past propensity to withdraw or quit, and thus also considered it in these analyses. Principal components analysis revealed that one factor accounted for 42.0% of the variance in these variables. Loadings for variables entering into this component were .75 for education tier[4], .73 for SRS Thoughts of Quitting High School, .56 for months in DEP (reversed), and .53 for SRS Reasons for Quitting Previous Jobs.

Deviance

In the SRS, respondents were asked to evaluate several items (i.e., 22a, 23, 24, 25g 25h 25j, 38e 38h, 39, 42, 43) related to deviant behavior. Additionally, two SRS composites dealt directly with deviance: Trouble in School and Potential Reasons for Leaving Army- Deviance. A few administrative variables (e.g., Medial Failure for Drugs, Moral Character Waiver) also tapped into recruits' past history of deviance. Principal components analysis revealed that four factors accounted for 46.6% of the variance in these variables. Loadings for each variable entering into these components are shown in Table H.2. The first component consisted of items that reflected in-school deviance. For the analyses, we refer to this component as Deviant I:

[3] Of course, the length of time spent in DEP is not usually a choice made by the recruit. For example, it may be a function of several factors such as (a) if a recruit signs up in high school, DEP usually lasts until after graduation, or (b) if a recruit joins near the end of the fiscal year, he/she may have a short DEP in order access within the current fiscal year (to meet recruiting goals). The reason we include months in DEP in this composite is because throughout a Soldier's time in DEP he or she is at risk for backing out of their contract (i.e., DEP loss). Thus, the longer he or she is in DEP (for whatever reason) and chooses not to leave, the longer he or she is exposed to a risk for withdrawal and survives. In this regard, we hypothesized that months in DEP reflected a propensity to complete.

[4] For purposes of building the past withdrawal propensity measure, we treated education tier as a dichotomous variable, high school diploma graduate vs. non-high school diploma graduate.

School Deviance. The second component consisted of items that dealt with thinking about leaving either school or the Army for deviance-related reasons. For the analyses, we refer to this component Deviant II: Deviant Withdrawal

Table H.2. Loading for Variables Entering Deviant Components

	Component			
Variable	I	II	III	IV
SRS 24:Were you ever suspended	**.82**	-.05	-.05	.02
SRS 22a:Never sent to principal's office (reversed)	**.80**	-.09	-.10	-.10
SRS Trouble in School	**.72**	.14	-.04	-.24
SRS 23:Were you ever expelled	**.46**	.12	.14	.15
SRS 25j:Didn't get along with authorities	.07	**.73**	.01	-.01
SRS 25g:Didn't get along with students	.00	**.69**	.00	.04
SRS 25h:The rules were too strict	-.04	**.65**	.05	.06
SRS Reasons for Leaving Army - Deviance	.02	**.34**	-.02	-.14
Medical Failure: Drugs	-.09	.04	**.73**	-.04
SRS 39:Moral waiver needed to join Army?	.05	.01	**.69**	-.04
SRS 43:How often drink alcohol before DEP	.05	-.09	.21	**-.65**
SRS 42:How often smoke before DEP	.10	-.03	.21	**-.60**
SRS 38h:Left job-conflict with supervisor	-.05	.17	-.21	**-.55**
SRS 38e:Left job-fired	.03	.05	-.08	**-.54**

Note. Based on principal components analysis with oblique rotation. The most salient loadings on each component are bolded.

Cognitions. The third component consisted of items that reflected deviance problems formally recognized by the Army (i.e., medical failures for drug use or moral character waivers). For the analyses, we refer to this component as Deviant III: Moral Waiver. Lastly, the fourth component consisted of items that reflected deviant behavior not specific to the school context (e.g., getting fired from a job, drinking). For the analyses, we refer to this component as Deviant IV: Non-School Deviance. Examination of intercorrelations among these components (see Table H.3) indicates that they had adequate levels of discriminant validity.

Table H.3 provides intercorrelations among all new variables we created for the preliminary structural model introduced in Chapter 4 (*Modeling Basic Combat Training Attrition*).

Table H.3. Intercorrelations Among New Variables

Variables	1	2	3	4	5	6	7	8	9	10	11
1 Positive Army Affect	1.00										
2 Perceived Utility/Ease of Withdrawal	**-.47**	1.00									
3 Core Army Values	**.53**	**-.29**	1.00								
4 Fitness	**.16**	.01	**.13**	1.00							
5 Medical I: Medical Waiver/Failure	.00	-.01	.01	**-.03**	1.00						
6 Medical II: Medical History Concerns	**-.19**	**.10**	**-.13**	**.02**	**.07**	1.00					
7 Past Withdrawal Propensity	**.03**	**-.05**	**.03**	**-.10**	-.01	**-.01**	1.00				
8 Deviant I: School Deviance	**-.08**	**.03**	**-.10**	.00	**-.02**	**.12**	**.27**	1.00			
9 Deviant II: Deviant Withdrawal Cognitions	**-.15**	**.04**	**-.15**	**-.12**	.01	**.13**	**.42**	**.22**	1.00		
10 Deviant III: Moral Waiver	**.02**	.01	**.03**	**.02**	**.01**	-.01	**.08**	**.15**	.01	1.00	
11 Deviant IV: Non-School Deviance	**-.14**	**.06**	**-.12**	**-.09**	.00	**.11**	**.31**	**.23**	**.19**	**.01**	1.00

Note. N = 21,422 to 28,471. Bolded correlations are statistically significant ($p < .05$, one-tailed)

APPENDIX I: CORRELATIONS BETWEEN PRE-TRAINING VARIABLES AND BCT ATTRITION

Note, for each table in this appendix: r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r_{pb} and c-statistics are significant ($p < .05$). Within each category, predictors are sorted in descending order by value of their correlation with the given type of attrition.

Table I.1. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Medical Attrition in the First Month of Service

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Gender	61,428	.06	.632	.014
SRS Single Items				
58. Level of stress/strain	28,080	.05	.689	.020
37. Medical advice against exercise	28,112	.05	.568	.023
SRS and AIM Composites				
SRS Attrition Cognitions	28,163	.09	.714	.022
SRS Reasons for Leaving Army - Problems Adjusting	27,980	.06	.652	.022
SRS Reasons for Leaving Army - All Reasons	28,100	.05	.656	.020
AIM: Physical Condition	15,496	-.05	.645	.025
SRS Affective Commitment	28,138	-.05	.640	.023
AIM: Adjustment	15,479	-.06	.651	.027
SRS Generalized Self Efficacy	28,137	-.09	.713	.021

Table I.2. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Medical Attrition in the Second Month of Service

Predictor	*N*	*r*	*c*	SE_c
SRS Single Items				
37. Medical advice against exercise	27,269	.05	.55	.01
58. Level of stress/strain	27,240	.05	.60	.01
SRS and AIM Composites				
SRS Attrition Cognitions	27,315	.08	.62	.01
AIM: Physical Condition	14,941	-.05	.57	.02
AIM: Adjustment	14,924	-.05	.58	.02
SRS Generalized Self Efficacy	27,291	-.07	.62	.01

Note. No administrative variable had a correlation with second month Medical attrition that was at least .05 in magnitude.

Table I.3. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Performance Attrition in the First Month of Service

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Gender	61,609	.07	.639	.012
CMF Category	61,601	.05	.631	.010
MOS Category (CA,CS,CSS)	61,609	.05	.619	.010
SRS Single Items				
58. Level of stress/strain	28,085	.06	.719	.019
59. Current level of morale	28,093	-.06	.656	.022
52. Advise male about joining Army	27,975	-.06	.624	.023
SRS and AIM Composites				
SRS Attrition Cognitions	28,169	.10	.721	.021
SRS Reasons for Leaving Army - Problems Adjusting	27,988	.07	.695	.021
SRS Reasons for Leaving Army - All Reasons	28,106	.06	.690	.019
SRS Thoughts of Quitting High School	27,609	.05	.604	.022
SRS Core Army Values - Duty, Integrity, Courage	28,136	-.05	.603	.023
AIM: Physical Condition	15,511	-.05	.639	.025
SRS Core Army Values - Loyalty, Selfless Service	28,133	-.06	.665	.021
AIM: Adjustment	15,494	-.06	.660	.026
SRS Affective Commitment	28,143	-.06	.672	.023
SRS Generalized Self Efficacy	28,142	-.08	.685	.021

Table I.4. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Performance Attrition in the Second Month of Service

Predictor	*N*	*r*	*c*	SE_c
Administrative				
Gender	59,590	.07	.599	.008
CMF Category	59,582	.06	.596	.007
MOS Category (CA,CS, CSS)	59,590	.05	.597	.007
SRS Single Items				
58. Level of stress/strain	27,255	.06	.620	.013
52. Advise male about joining Army	27,147	-.06	.564	.014
SRS and AIM Composites				
SRS Attrition Cognitions	27,335	.09	.634	.013
SRS Reasons for Leaving Army - Problems Adjusting	27,158	.07	.625	.013
SRS Reasons for Leaving Army - All Reasons	27,273	.05	.614	.012
AIM: Adjustment	14,880	-.05	.586	.016
SRS Core Army Values - Loyalty, Selfless Service	27,300	-.05	.588	.013
AIM: Physical Condition	14,897	-.05	.601	.016
SRS Affective Commitment	27,310	-.06	.607	.013
SRS Generalized Self Efficacy	27,309	-.06	.598	.014

APPENDIX J: ADDITIONAL PARAMETER ESTIMATES FOR STRUCTURAL MODELS OF MEDICAL AND PERFORMANCE BCT ATTRITION

Table J.1. Model Parameter Estimates and Wald Statistics for Direct Effects on Secondary Endogenous Variables in Final Structural Models of Medical and Performance Attrition

	Medical Attrition				Performance Attrition			
	1st Month		2nd Month		1st Month		2nd Month	
Outcome/Predictor	*b*	*Wald*	*b*	*Wald*	*b*	*Wald*	*b*	*Wald*
Attrition Cognitions								
Intercept	2.14		2.14		2.14		2.10	
Positive Army Affect	-0.40	-67.80	-0.39	-66.08	-0.40	-68.11	-0.39	-66.75
Generalized Self Efficacy	-0.33	-49.84	-0.32	-47.88	-0.33	-49.76	-0.31	-46.63
58. Stress/Strain	0.07	30.18	0.06	29.44	0.07	30.26	0.06	29.35
57h. Homesickness	0.20	27.83	0.20	27.48	0.20	27.88	0.20	27.56
Utility/Ease of Withdrawal	0.11	22.98	0.11	22.44	0.11	23.30	0.11	22.60
Reasons for Potentially Leaving Army- All	0.02	13.58	0.01	12.80	0.02	13.91	0.02	13.86
Reasons for Joining Army- Personal Growth	-0.04	-12.64	-0.04	-12.26	-0.04	-12.55	-0.04	-12.16
Core Army Values	-0.05	-11.29	-0.05	-11.81	-0.05	-11.33	-0.05	-11.72
Reasons for Joining Army- Travel	-0.02	-6.98	-0.02	-7.21	-0.02	-7.16	-0.02	-6.94
Generalized Self-Efficacy								
Intercept	3.65		3.66		3.67		3.66	
Attrition Cognitions	-0.63	-77.44	-0.63	-74.16	-0.63	-77.47	-0.62	-73.83
Fitness	0.20	58.30	0.21	57.78	0.20	58.48	0.21	57.92
4. Perceived Familiarity with Army	0.08	24.18	0.08	23.80	0.08	24.17	0.08	24.02
AFQT Score	0.00	18.16	0.00	17.70	0.00	17.93	0.00	17.65
Core Army Values	0.09	17.44	0.09	17.16	0.09	17.58	0.09	18.10
Unsure About Army Career	-0.05	-15.65	-0.05	-16.07	-0.05	-15.41	-0.05	-16.54
Medical II: Medical History Concerns	-0.04	-12.84	-0.04	-11.77	-0.04	-12.39	-0.03	-9.82
Female	-0.11	-11.70	-0.11	-10.96	-0.11	-11.83	-0.11	-11.56
Stress/Strain								
Intercept	3.66		3.66		3.66		3.61	
Positive Army Affect	-0.59	-34.64	-0.59	-33.61	-0.59	-34.58	-0.58	-33.66
Race: Black	-0.52	-25.18	-0.52	-24.52	-0.52	-25.20	-0.52	-25.36
57h. Homesickness	0.50	21.40	0.50	20.99	0.50	21.32	0.50	21.06
Unsure About Army Career	0.14	16.94	0.14	16.79	0.14	16.91	0.14	17.27
Reasons for Potentially Leaving Army- All	0.05	14.07	0.05	13.74	0.05	14.04	0.05	14.11
Race: Hispanic	-0.34	-12.89	-0.34	-12.86	-0.34	-12.96	-0.34	-12.70
Race: Other	-0.36	-10.09	-0.37	-10.09	-0.36	-10.13	-0.36	-10.05
Female	0.24	9.97	0.23	9.25	0.24	9.83	0.21	8.80
Medical II: Medical History Concerns	0.07	8.35	0.07	8.09	0.07	8.44	0.07	7.84
4. Perceived Familiarity with Army	-0.07	-8.32	-0.07	-8.54	-0.07	-8.32	-0.07	-8.41
Reasons for Joining Army- Personal Growth	0.07	7.04	0.07	7.07	0.07	7.07	0.07	7.03
Reasons for Joining Army- Travel	-0.05	-6.23	-0.05	-6.01	-0.05	-6.40	-0.05	-5.87

Note. For each outcome, predictors are sorted in descending order by average magnitude of their Wald statistic across the first two months of service and both criteria. Paths with Wald statistics that exceed 1.65 are statistically significant ($p < .05$, one-tailed).

APPENDIX K: CORRELATIONS BETWEEN PRE-TRAINING VARIABLES AND OSUT ATTRITION

Note, for each table in this appendix: r = Point-biserial correlation or phi coefficient. c = c-statistic. SE_c = standard error of c-statistic. All r and c-statistics are significant ($p < .05$). Within each category, predictors are sorted in descending order by value of their correlation with the given type of attrition.

Table K.1. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Medical Attrition in OSUT

Predictor	*N*	*r*	*c*	SE_c
Administrative				
OSUT MOS	20,066	.06	.580	.009
Race/Ethnicity	20,066	.05	.554	.009
Gender	20,066	.05	.525	.009
SRS Single Items				
37. Medical advice against exercise	10,664	.08	.544	.013
58. Level of stress/strain	10,666	.07	.592	.012
36. # Serious injuries before Army	10,675	.06	.554	.013
40. Medical waiver needed to join Army	10,645	.05	.529	.013
52. Advise male about joining Army	10,637	-.05	.531	.013
25a. Never thought about quitting HS	10,496	-.05	.545	.013
47. Work I enjoy most is available	10,648	-.05	.554	.013
05. How long in DEP	10,602	-.05	.563	.012
59. Current level of morale	10,661	-.05	.555	.013
SRS and AIM Composites				
SRS Attrition Cognitions	10,688	.12	.610	.013
SRS Reasons for Leaving Army - All Reasons	10,677	.07	.587	.012
SRS Reasons for Quitting Previous Jobs	10,607	.06	.574	.012
SRS Reasons for Leaving Army - Problems Adjusting	10,650	.06	.559	.013
AIM: Physical Condition	6,612	-.05	.556	.014
SRS Affective Commitment	10,683	-.05	.553	.013
AIM: Adjustment	6,610	-.05	.558	.014
SRS Generalized Self Efficacy	10,678	-.12	.610	.013

Table K.2. Zero-Order Validities and c-Statistics for Top Pre-Training Predictors of Performance Attrition in OSUT

Predictor	*N*	*r*	*c*	SE_c
Administrative				
OSUT MOS	20,039	.07	.617	.011
SRS Single Items				
58. Level of stress/strain	10,644	.06	.605	.018
05. How long in DEP	10,580	-.05	.578	.016
59. Current level of morale	10,639	-.06	.576	.018
52. Advise male about joining Army	10,615	-.06	.556	.018
25a. Never thought about quitting HS	10,474	-.08	.607	.018
SRS and AIM Composites				
SRS Attrition Cognitions	10,666	.10	.627	.018
SRS Reasons for Leaving Army - Problems Adjusting	10,629	.08	.620	.017
SRS Thoughts of Quitting High School	10,474	.07	.614	.018
SRS Reasons for Leaving Army - All Reasons	10,655	.07	.612	.017
SRS Trouble in School	10,513	.05	.588	.017
SRS Reasons for Leaving Army - Deviance	10,608	.05	.557	.018
SRS Affective Commitment	10,661	-.06	.584	.018
AIM: Adjustment	6,618	-.06	.590	.019
AIM: Dependability	6,619	-.07	.594	.018
AIM: Agreeableness	6,626	-.07	.587	.019
SRS Generalized Self Efficacy	10,656	-.07	.589	.018
AIM: Physical Condition	6,620	-.08	.601	.019