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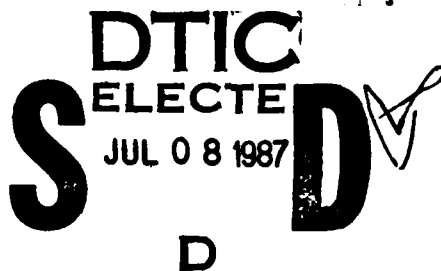


**Delayed Entry Program
Contracting Cohort Loss Analysis:
A Replication**

Jeanna F. Celeste

Westat, Inc.

**Personnel Utilization Technical Area
Manpower and Personnel Research Laboratory**



U. S. Army

Research Institute for the Behavioral and Social Sciences

February 1985

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first six months of FY82). Individual contract-level data on characteristics such as length of time in the DEP, AFQT groups, education level, and gender were examined for their relationship to contracting cohort loss rates.

Research Report 1402

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FOREWORD

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The use of delayed entry programs in processing enlistments for the military services has become an increasingly popular recruiting mechanism and is likely to remain a major component of recruiting for the all-volunteer military force for some time. To provide support for the Army in establishing effective procedures for managing the DEP, the Army Research Institute has initiated research through its Enlisted Recruitment and Retention Project. This research report presents the approach and findings of a DEP contract loss analysis performed using a cohort methodology. The analysis was conducted as a replication of work performed earlier by the U.S. Army Recruiting Command's DEP Efficiency Task Force. It used data from the same source as the task force but employed a different methodology.

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EDGAR M. JOHNSON
Technical Director

**DELAYED ENTRY PROGRAM CONTRACTING COHORT LOSS ANALYSIS:
A REPLICATION**

EXECUTIVE SUMMARY

Requirement:

To examine the rate of contract losses from the U.S. Army's Delayed Entry Program (DEP) for enlistment contracts written from October 1980 to March 1983.

Procedure:

The contracts data base was constructed using the U.S. Army Recruiting Command's FY81, FY82, and FY83 Mini-master files. These data included individual-level contractee characteristics and permitted calculation of rates of loss across time by cohort. Briefly, each month for which contract data were available was treated as a "contracting cohort." Data collected 12 months after the contract date were used to ascertain the final status of the contracts as either accessions or lost contracts.

Findings:

There were numerous variables from the DEP Task Force's original DEP Loss Analysis which were also found to be related to the cohort loss rate. A summary of the findings follows.

The general trend for contracts written from FY81 to the first six months of FY83 was a reduction in contract losses (there is some uncertainty with regard to the FY83 data as final dispositions were not complete for all contracts).

The length of time contracted to be in the DEP was positively related to the loss rate.

The relationship between AFQT level and the DEP loss rate was not consistent across the three contracting periods. This was most likely due to fluctuations in contracting policies regarding the length of time that individuals at specific AFQT levels were permitted to remain in the DEP.

Contractee education level was grouped into 2 categories, i.e., non-high school graduates and high school seniors and graduates. For the male contractees, the latter group experienced lower rates of losses. There were no significant differences among females by education level.

Female contractees experienced loss rates more than twice the rates of males across the three contracting periods (FY81, FY82, first 6 months of FY83).

Utilization of Findings:

The individual contract-level characteristics and system-level variables examined in this research report can be used by the U.S. Army to develop more efficient recruiting strategies. Given the Army's recruit manpower requirements, USAREC can adjust missions to take into account the higher likelihood of losses from certain types of contractees.

Before such actions can be recommended, more extensive multivariate analyses need to be undertaken. The simultaneous examination of many different types of factors needs to be performed in order to better interpret how important each variable is in predicting contracting outcomes. The apparent relationship between a dependent variable, such as contracting outcome, and a single independent variable may be negated or may become much less significant when considered in conjunction with other variables. This important analytic process must continue beyond the preliminary work described in this paper.

The findings from the multivariate efforts will be discussed in forthcoming technical reports.

**DELAYED ENTRY PROGRAM CONTRACTING COHORT LOSS ANALYSIS:
A REPLICATION**

CONTENTS

	Page
INTRODUCTION	1
Delayed Entry Programs	1
Organization of Paper	2
BACKGROUND	3
Army's DEP Efficiency Task Force	3
The DEP Loss Analysis	3
DEP Research Under the Army Recruitment and Retention Project	4
APPROACH	6
Development of the Data File for the DEP Loss Replication Analysis	6
Cohort Methodology	7
Development of "Contracting Cohorts"	9
Resolution of Open DEP Contract Status for FY81 and FY82 Contracts	11
COHORT LOSS ANALYSES	14
Major Findings of the Cohort Loss Analyses	14
Length of Time Contracted to be in the DEP is Positively Related to the Loss Rate	15
AFQT Categories are Differentially Related to Contracting Outcomes	17
Educational Levels are Differentially Related to Contracting Outcome	22
Gender is Related to Contracting Outcome	23
Educational/AFQT/Gender Groups Manifest Different Contracting Outcomes	28
Differences by Education, AFQT, and Gender	28
Contracting Cohorts of Graduate/Senior Males	29
Contracting Cohorts of Non-High School Graduate Males	32
Contrasts of Graduate/Senior Male Contracts with Non-High School Graduate Male Contracts	32
Contracting Cohorts of Graduate/Senior Females	32
Contracting Cohorts of Non-High School Graduate Females	33
General Tendencies from the Contracting Cohort Analyses	33
Summary of Findings from the Contracting Cohort Loss Analyses	34

DELAYED ENTRY PROGRAM CONTRACTING COHORT LOSS ANALYSIS:
A REPLICATION

CONTENTS (Continued)

	Page
CONCLUSIONS	36
REFERENCES	37

LIST OF TABLES

Table 1A.	Example of a cohort table demonstrating strong cohort effects	10
Table 1B.	Example of the same cohort table demonstrating strong period effects	10
Table 1C.	Example of the same cohort table demonstrating strong grouping variable effects	10
Table 2.	Contract month by record type	12
Table 3.	Time elapsed between projected active duty date and end date of contracts file for open DEP contracts	13
Table 4.	Percent and number of contract losses across DEP length	16
Table 5.	Comparisons of contract losses among AFQT levels	18
Table 6A.	Comparisons of contracting outcomes among specific AFQT categories (for contracts written in FY81)	19
Table 6B.	Comparisons of contracting outcomes among specific AFQT categories (for contracts written in FY82)	20
Table 6C.	Comparisons of contracting outcomes among specific AFQT categories (for contracts written in the first six months of FY83)	21

DELAYED ENTRY PROGRAM CONTRACTING COHORT LOSS ANALYSIS:
A REPLICATION

CONTENTS

LIST OF TABLES (continued)	Page
Table 7. Comparisons of loss rates among aggregated educational levels for contracts written in FY81, FY82, and the first 6 months of FY83 . . .	23
Table 8. Comparisons of male and female loss rates for contracts written in FY81, FY82, and the first 6 months of FY83	24
Table 9. Comparisons of the distribution of female (DEP) contracts across DEP length	25
Table 10. Comparisons of contract loss rates by gender within aggregated educational levels	26
Table 11. Comparisons of contract loss rates among aggregated educational levels controlling for gender	27
Table 12. Comparisons of male and female DEP length and loss rates across AFQT levels within educational groups	30

LIST OF FIGURES

Figure 1. Data file construction for contracts	8
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DELAYED ENTRY PROGRAM CONTRACTING COHORT LOSS ANALYSIS:
A REPLICATION

INTRODUCTION

Delayed Entry Programs

The use of delayed entry programs in processing enlistments for the military services has become an increasingly popular recruiting mechanism. The Army, Navy, and Air Force all utilize their own delayed entry programs (DEP). Basically, these systems allow potential recruits to contract for enlistment in specific occupational training as much as 12 months in advance of their actual shipping or accession dates. Should the potential recruit join the service promptly after signing a service obligation (contract), he or she would not enter the DEP and would be called a "direct shipment."¹

There are numerous positive effects to the recruiting system from using delayed entry. Having immediate shipping goals met allows recruiters to concentrate on filling future missions with high quality recruits.² Knowing in advance the types and numbers of entering recruits facilitates internal planning for training seat availability. This system also provides flexibility for the services to reallocate resources and quotas to increase productivity. Maintaining a DEP pool is believed to increase recruiting productivity as recruits in the DEP may encourage referrals from their friends.³ Also, research conducted by the Air Force indicated that recruits who accede from the DEP are less likely to become attritees during the training period.⁴

¹ The amount of time allowed to elapse between contracting and shipping before an applicant is said to have entered the DEP varies across services. For example, the Air Force considers a time lag of 15 days or more between contracting and shipping to be participation in the DEP. The Navy and Army use one month as the criterion for DEP participation.

² Morey, Richard C. Management of the armed services' delayed entry pools: A comparison of recruiting philosophies and issues (ONR-200-9). Durham, NC: Duke University, Fuqua School of Business, December, 1982, p. 2.

³ This theory cannot be easily proved or disproved as it is difficult to distinguish the cause from the effect. Recruiters who maintain substantial DEP pools may be successful because the pool generates leads and referrals or a large DEP pool may simply be the product of a successful recruiter. Whether referrals occur at all needs to be examined.

⁴ Schumacher, (Captain), The delayed entry program: A costing analysis or 'What is the optimum size of the DEP?', briefing papers. Air Force Recruiting Command, 1981.

There are also disadvantages to using the DEP. For instance, length of time in DEP counts as longevity for base pay thereby increasing salaries (and potentially reducing years of active service before retirement). Another potential disadvantage to using the DEP relates to the military's flexibility. Once a DEP pool is built up, it may be very difficult to adjust the flow of accessions into the system should accession quotas need to be reduced rapidly.

Further, although use of the DEP permits more efficiency in planning for and scheduling resources, problems associated with DEP contracting could interrupt a smooth transition from planning to implementation. For instance, losses of recruits from the DEP creates vacancies in previously filled training seats. Losses create recruiting inefficiency as resources expended to recruit and retain attriting DEPs could have been utilized elsewhere.

Maintaining DEP pools takes away some of recruiters' time from other prospecting and recruiting activities. Recruiters, particularly those nearing the end of their recruiting duties, may allow their DEP pools to dwindle--"living off" earlier recruiting efforts.⁵ This creates a lag effect in the productivity of entering recruiters who must build contacts and a DEP pool without an existing foundation.

Utilization of delayed entry programs is likely to remain a major component of recruiting for the all-volunteer military force for some time to come. It is necessary, therefore, for the services to establish effective procedures for managing the DEP. In light of this, the Army Research Institute of Behavioral and Social Sciences (ARI) initiated research on the Army's DEP through the Enlisted Recruitment and Retention Project contracted with Westat, Inc.

Organization of Paper

This is the first in a series of reports describing research conducted for ARI on the U.S. Army's Delayed Entry Program under Contract MDA903-81-C-0227. This research report presents the approach and findings of a DEP contract loss analysis performed using a cohort methodology. This analysis was conducted as a replication of work performed earlier by the U.S. Army Recruiting Command's DEP Efficiency Task Force. The DEP contracting cohort loss analysis used data from the same source as the task force but employed a different methodology.

Results from the DEP Efficiency Task Force's analysis and results from the early DEP research efforts under the Enlisted Recruitment and Retention Project are discussed in the Background section of this paper. The next chapter describes the data file construction and methodological approach of the DEP contracting cohort loss analysis. This is followed by presentation of analytic findings and finally a conclusions section.

⁵ Morey, Richard C. Management of the armed services' delayed entry pools, pp. 4-6.

BACKGROUND

This chapter briefly discusses the research efforts which preceded the DEP contracting cohort loss analysis. These include the work of the DEP Efficiency Task Force and the analysis and findings of their DEP loss study. The initial analytic efforts of the ARI/Westat DEP research team are also described along with a summary of the findings.

Army's DEP Efficiency Task Force

The U.S. Army's Recruiting Command (USAREC) established a DEP Efficiency Task Force in early FY83. This body's purpose was to provide a management plan supporting the short- and long-term needs of the recruiting command. The plan was designed to reduce losses from the Army's DEP through better management practices. It also aimed at providing consistency of policy information at all levels of the recruiting command which, in turn, would result in a more cohesive management system for the field force and line management.⁶

The Task Force defined a number of problem areas to be addressed. Many of the problems involved poor recruiting practices related to management of the DEP. Among these were: recruiters' failure to use support programs such as COI/DEP which function to encourage DEP referrals, lack of "pride of ownership," absence of penalties to recruiters for DEP losses, absence of training to prepare DEPs for active duty, lack of formal training on how to use the DEP to generate referrals, and failure of the chain of command to ensure that recruiters maintain contact with their DEP pool.⁷ These problems were further investigated by the DEP Task Force.

The DEP Loss Analysis

In order better understand the DEP contracting process, the Task Force carried out an analysis of DEP losses for FY81, FY82, and the first three months of FY83. The DEP Task Force examined monthly loss rates and average time in the DEP across education/gender groups and within education/gender groups by AFQT. The categories of the education/gender groups included male and female high school graduates and high school seniors, and male and female non-high school graduates. In a separate analysis, the pool of male high school seniors was estimated by AFQT level and their loss rates analyzed. Overall contract loss rates were compared across the fiscal years. The contract loss rates for different education/gender groups were compared across recruiting regions and districts for different fiscal years.

⁶ DEP Efficiency Task Force, unpublished working papers outlining the problem areas of the Army's Delayed Entry Program, and the scope and objectives of the Task Force. Ft. Sheridan, IL: USAREC, 1983, p. 2.

⁷ Ibid., p. 3.

The Task Force reached a number of conclusions based on their analyses:⁸

- DEP loss was not highly correlated with average time in DEP;
- DEP loss should not be a significant consideration in contract strategy;
- Certain accession months had higher DEP loss rates than others but this was a function of category acceding rather than pure seasonality;
- Mental category was not a significant factor in DEP loss;
- DEP loss did not appear to be a function of the current size of DEP; DEP size should be driven by command strategy rather than DEP loss; and
- DEP loss was positively correlated with gender and education in the following order: female high school (HS) seniors, female HS graduates, male seniors, male non-graduates, male HS graduates;
 - HS seniors were lost at twice the rate of HS graduates; nonetheless, the percent lost (7.4) was considered low enough to justify continuing to write the maximum number of contracts because of advantages gained from DEP referrals.

DEP Research Under the Army Recruitment and Retention Project

At about the same time that the DEP Efficiency Task Force was conducting its analyses, the Army Research Institute of Behavioral and Social Sciences (ARI) was initiating independent research on the Army's DEP. This was being conducted under the Enlisted Recruitment and Retention Project contracted with Westat, Inc.

The data bases used by the ARI/Westat and the DEP Task Force team did not contain exactly the same variables as they were not from the same source. The DEP Task Force used Mini-master contract data. The Mini-master is developed from the dual-source master files relying primarily on the REQUEST system supplemented by the Military Examination Processing Reporting System (MEPRS) data for invalid or missing elements. The ARI/Westat team relied on contracts data supplied by the Defense Manpower Data Center (DMDC). DMDC's data came exclusively from the MEPRS. These data covered the contracting period from October 1980 to June 1981.

⁸ DEP Efficiency Task Force, "DEP loss analysis." Briefing prepared by the Task Force. Ft. Sheridan, IL: USAREC, February, 1983.

Initial ARI/Westat DEP research findings fell into three major categories: (1) description of contractees who entered the DEP; (2) the rate of DEP loss; and (3) the correlates of DEP loss. In summary, the findings included the following:

Description of contractees who entered the DEP

- (1) Nearly 80% of all Army recruits enter through DEP;
- (2) DEP entrants tend to come from higher mental categories than direct shipments;
- (3) DEPers are slightly younger than direct shipments;
- (4) There is little difference in DEP versus direct ship entrance rates as a function of race or gender;

The rate of DEP loss

- (5) 9.24% of those entering DEP in the cohort sample did not accede;
- (6) DEP loss represented 7.25% of all sampled contracts (DEPers plus direct shipments);
- (7) Females were lost at a higher rate than males (18.0% versus 7.2%);

The correlates of DEP loss

-- Individual Characteristics

- (8) DEP loss had a bimodal relationship to age (for males and females alike) with losses highest for contractees over 30, and those 18-19.
- (9) DEP loss was lower for higher mental categories (for both males and females);
- (10) Individuals who required PULHES waivers were lost at much higher rates than those not requiring waivers, 76.7% versus 7.8% (females were overrepresented among PULHES waiver holders);

-- Systems Characteristics

- (11) Longer DEP lengths were associated with higher loss rates;
- (12) There was considerable variability in loss rates across MOS;
- (13) There was a fair amount of variability in the loss rates within CMF; and
- (14) 25% of the variance in MOS loss rates was accounted for by DEP length.

There were some obvious differences in the findings which came out of the analyses (i.e., DEP Task Force's analysis and ARI/Westat's work). For example, the Task Force's DEP Loss Analysis found no relationship between accession status and length of time in the DEP. The contracts analysis using the DMDC data, however, showed a very strong relationship between contracted DEP length and DEP loss. Also, the DEP Task Force did not find a relationship between mental category and DEP loss while the ARI/Westat research team found lower loss rates for contractees in the higher AFQT levels. Due to the different focuses taken by each group, there were varying types of findings coming out of the analyses which made direct comparison of outcomes difficult.

Examination of these differences led to questions regarding the comparability of the two data sources. In order to test whether the findings were due to differences in the analytic approaches or to dissimilar data, ARI proposed that the ARI/Westat DEP research team replicate the DEP Loss Analysis using USAREC's Mini-master contracts data. The methodology to be employed, however, would be the cohort method used in the early work on the DMDC files.

APPROACH

The Approach chapter describes the data file construction and methodological approach used in the replication of the DEP contract loss analysis.

Development of the Data File for the DEP Loss Replication Analysis

USARCPAE (the Program Analysis and Evaluation Directorate of USAREC) provided Westat with computer tapes of Mini-master files for FY81, FY82, and FY83. Regular active Army contracts written between October 1980 and March 1983 were included in the replication analyses.

Extensive work was conducted on the three Mini-master tapes in preparation for creating a single data file that merged all three fiscal years' contract data:

- First, the non-prior service (NPS) records with contract dates between 1 October 1980 and 31 March 1983, and valid accession and discharge dates were selected.
- Second, two logical screens were performed: records containing both a valid accession date and a valid DEP discharge date were dropped; records in which the accession or discharge date preceded the contract date were also eliminated.
- Third, record type codes were developed based on the dates contained in the individual records. The selection criteria for defining record type were as follows: (1) direct ship accessions had identical contract and accession dates and no discharge dates; (2) open DEP contracts had neither accession nor discharge dates; (3) DEP accessions

had accession dates occurring after the contract date and no discharge dates; and last, (4) DEP losses had discharge dates occurring after the contract dates and no accession dates.

- Fourth, the individual Mini-masters, FY81, FY82, and FY83, were merged into a single file. Figure 1 illustrates the data merge procedures described below. The FY82 file was searched for contracts which were written during FY81. These contracts were then matched by social security number to the FY81 file. Records from the earlier FY were dropped in favor of the more current FY records. This procedure avoided the problem of having more than one record per contract. It also insured that the most up-to-date contract information available was used in the analysis.
- Finally, the unique FY81 records were merged with the FY82 file. The FY83 Mini-master file was then searched for contracts written during FY81 and FY82. Again, the contract records from the earlier FY's were dropped if more current records were located in the FY83 file. The unique contract records from FY81 and FY82 were merged with the FY83 file.

No Mini-master data were available beyond 30 September 1983; therefore, the FY83 contract records could not be updated as the FY81 and FY82 contracts had been. Thus, many of the FY83 contracts had no final accession status at the close of the fiscal year. This is because many of the contracts had projected active duty dates beyond 30 September 1983. Since data were not available past that date it was not possible to identify these contracts as either accessions or losses. They were simply referred to as "open" DEP contracts. This concluded the work involved in putting together the contracts data file.

Cohort Methodology

A key feature of the replication analysis centered around the employment of cohort methodology in estimating DEP loss. A cohort consists of those people within a geographically or otherwise delineated population who experienced the same life event within a given period of time. Cohort boundaries are arbitrarily delineated, since the "given period of time" may be of any length, from a day (or less) to 20 years (or more), and it may begin at any arbitrarily selected point in time.⁹

⁹Glenn, Norval D. Cohort analysis. Series: Quantitative Applications in the Social Sciences, Number 07-005. Beverly Hills: Sage Publications, 1977, p. 8.

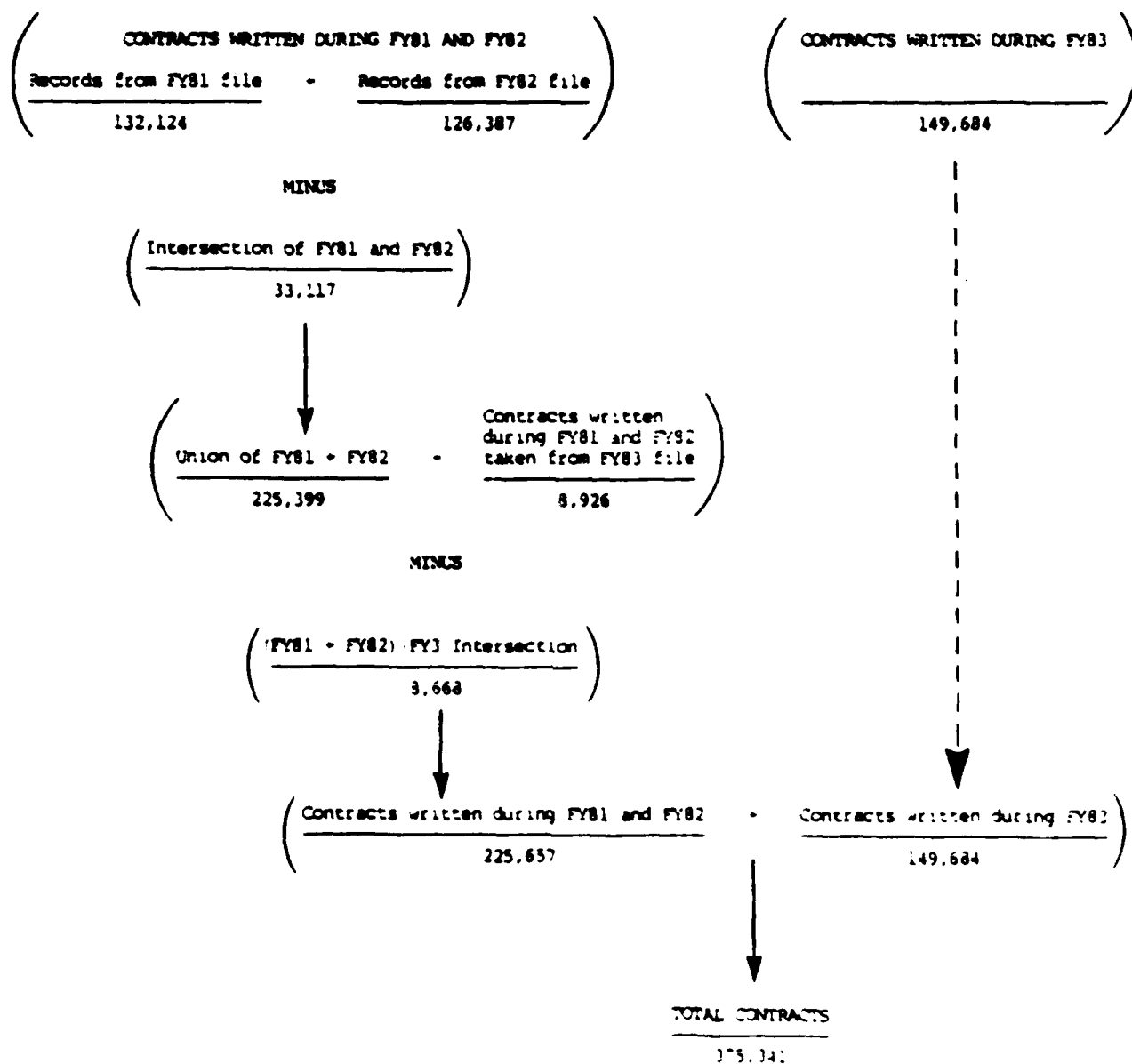


Figure 1. Data file construction for contracts

Cohort methodology is useful in examining the characteristics of one or more cohorts at two or more points in time. This method helps to disentangle period effects (i.e., period during which the compared life event took place) from the effects of being in a particular cohort, and from the effects of being in a particular group (for example, age group, educational group, etc.). Simple examples are provided in Tables 1A-1C. In the first table, 1A, one can see that belonging to particular birth cohorts has a great effect on whether or not one is registered to vote.

In the second table, 1B, there is something special about the 1984 election that determines whether or not people are likely to be registered to vote.

In the final example, Table 1C, belonging to particular age groups bears heavily upon whether or not one is likely to be registered to vote.

Most cohort analyses are not fortunate enough to have such clear-cut data and thus much more effort is required in the attempt to interpret what effects are causing which results. Suffice it to say that cohort methodology aids in focusing on the different factors affecting the analytic results.

Development of "Contracting Cohorts"

In the replication analysis, individuals signing enlistment contracts each month from October 1980 to September 1983 represents a "contracting cohort." Each month contracts were written for individuals with varying educational backgrounds, gender, and AFQT levels for various DEP lengths, and MOS, etc. In this sense, every contract month represents a subsample of the entire three year timeframe.

Each contracting cohort was followed for 12 months and then evaluated as to contracting outcomes. If a contract had recorded an enlistment date within the 12 month period, then it was considered a DEP accession. If the contract had recorded a DEP discharge date within 12 months of its contract date, then it was classified as a lost DEP contract. Also, because the maximum amount of time that a DEP contract can remain open is 12 months, any DEP contracts that had recorded neither accession nor discharge dates within 12 months of contracting were assumed to be unrecorded losses.

The cohort methodology was employed to insure that contracts were permitted sufficient time for "maturation." That is, since enlistment contracts may take as much as 12 months from contract signing until the shipping date, it is not accurate to calculate loss rates for a particular time period until 12 months after contract signing. Calculations of loss rates conducted prior to this 12 month maturation period are at risk of underestimating the actual rates.

Each contracting cohort was, therefore, to be permitted a 12 month time lag before calculating a cohort loss rate. With contracts data through FY83, "mature" cohorts were available for contracts written during FY81 and FY82. A maturation period of 12 months was, obviously, not possible for the FY83

Table 1A. Example of a Cohort Table Demonstrating Strong Cohort Effects

<u>Birth Cohorts</u>	<u>Percent of Individuals Registered to Vote</u>		
	<u>1976</u>	<u>1980</u>	<u>1984</u>
<u>Age</u>			
18-21	60%	70%	74%
22-25	55%	60%	58%
26-29	72%	55%	60%
30-33	80%	72%	55%
34-37	66%	80%	72%

Table 1B. Example of the Same Cohort Table Demonstrating Strong Period Effects

<u>Birth Cohorts</u>	<u>Percent of Individuals Registered to Vote</u>		
	<u>1976</u>	<u>1980</u>	<u>1984</u>
<u>Age</u>			
18-21	55%	68%	75%
22-25	72%	60%	76%
26-29	63%	70%	74%
30-33	59%	64%	77%
34-37	73%	56%	76%

Table 1C. Example of the Same Cohort Table Demonstrating Strong Grouping Variable Effects

<u>Birth Cohorts</u>	<u>Percent of Individuals Registered to Vote</u>		
	<u>1976</u>	<u>1980</u>	<u>1984</u>
<u>Age</u>			
18-21	50%	50%	51%
22-25	52%	53%	51%
26-29	65%	66%	67%
30-33	75%	76%	76%
34-37	68%	66%	67%

contracting cohorts. Many of the contracts written in FY83 had scheduled shipping dates in FY84. This made it impossible to ascertain final contract dispositions using only FY83 data. Contracts which had not yet passed their projected active duty dates as of September 30, 1983 were considered "open" DEP contracts. That is, they could not be classified as either accessions or losses.

To gauge how widespread open contracts were throughout the FY83 contract months, a crosstable of contract month by record type (i.e., accession, lost DEP contract, etc.) was prepared. The results are presented in Table 2.

Upon examination of Table 2, it was clear that the further into FY83 contracts were written, the more likely they were to be unresolved, i.e., open DEP contracts. After March 1983, the percentage of unresolved DEP contracts becomes too high to include further FY83 contract months in an analysis of contracting outcomes. Even for contracts written in the first six months of FY83, there are sufficient numbers of open DEP contracts to warrant looking at the open contracts as a separate category of contracting outcome. This avoided their complete elimination from the analysis and permitted rough estimation of their final dispositions.

Resolution of Open DEP Contract Status for FY81 and FY82 Contracts

In order to perform a contracts loss analysis it is important to be able to classify cases as either losses or accessions. When a contract lacked either a DEP discharge date or an accession date after 12 months in the DEP, some final determination of contract outcome was in order.

A technique that was used to determine the final disposition of unresolved DEP contracts written during FY81 and FY82 was to compute the amount of time that the contract had expired. That is, how many months had elapsed from the projected active duty date on the contract to the final date covered by the data tape. If the time was equal to or greater than one month, the contract had passed its projected active duty date and could be considered a loss. For FY81 and FY82 cohorts, 1,675 contracts (0.74% of the sample) were closed as losses in this way. An additional 14 contracts had elapsed times of zero or fewer months, probably due to invalid projected active duty dates, which could not be closed. These cases were dropped from the analysis. Table 3 presents the outcome of this procedure.

For contracts written during FY81 and FY82, at least one full year had transpired without an updated record to close the contract either as a loss or an accession. This provided additional assurance that, in fact, any unresolved contracts were almost certainly losses.

No contracts written in FY83 were closed as losses using this procedure. This technique was used simply as an additional piece of information about the contract's disposition. There were far fewer FY83 open DEP contracts that had expired during the same fiscal year than there were expired open contracts

Table 2. Contract month by record type (for contracts written during FY83)

Contract Month	Record Type (Frequency/Row Percent)				
	Direct Shipment Accessions	Open DEP Contracts	DEP Accessions	Lost DEP Contracts	TOTAL/ OVERALL %
October 82	309 2.45	31 0.25	11620 92.08	659 5.22	12619 8.43
November 82	134 1.12	178 1.48	11022 91.80	672 5.60	12006 8.02
December 82	62 0.50	269 2.15	11546 92.42	616 4.93	12493 8.35
January 83	153 1.13	351 2.60	12422 91.95	584 4.32	13510 9.03
February 83	192 1.44	460 3.44	12126 90.74	586 4.38	13364 8.93
March 83	137 0.94	698 4.79	12988 89.20	737 5.06	14560 9.73
April 83	67 0.55	962 7.93	10534 86.80	573 4.72	12136 8.11
May 83	102 0.87	2991 25.43	8182 69.56	488 4.15	11763 7.86
June 83	83 0.58	6293 43.96	7554 52.77	385 2.69	14315 9.56
July 83	231 1.95	6576 55.54	4852 40.98	181 1.53	11840 7.91
August 83	247 2.06	10097 84.22	1598 13.33	47 0.39	11989 8.01
September 83	296 3.26	7671 84.40	1097 12.07	25 0.28	9089 6.07
TOTAL/ OVERALL %	2013 1.34	36577 24.44	105541 70.51	5553 3.71	149684 100.00

Table 3. Time (in months) elapsed between Projected Active Duty Date (PADD) and end date of contracts file for open DEP contracts

Months Elapsed Between PADD and 30 Sept. '83	Year of Contract Signing (Contract Frequencies)	
	FY81 and FY82	FY83 .
1	10	57
2	38	35
3	153	17
4	109	17
5	10	5
6	28	12
7	50	22
8	94	23
9	108	2
10	265	2
11	161	2
12	127	-
13	91	-
14	74	-
15	69	-
16	48	-
17	50	-
18	49	-
19	40	-
20	38	-
21	28	-
22	23	-
23	9	-
24 or more	3	-
Bad PADD	14	6
TOTAL EXPIRED CONTRACTS AS OF 30 SEPT. '83	1,675	194

from the previous two fiscal years. Judging from Table 3, loss rates were somewhat understated across each of the fiscal years. However, since so many FY83 contracts had not yet passed their projected active duty dates (PADD), the "open DEP contract" status was carried through the analysis as a disposition for contracts written during FY83.

This was the final procedure in setting up and cleaning the contracts data file. The next section of this report details the replication analyses and findings.

COHORT LOSS ANALYSES

As in the DEP Efficiency Task Force's work on the DEP Loss Analysis, the Cohort Loss Analyses examined monthly loss rates and average time in the DEP. These statistics were compared across educational groups, mental categories (AFQT levels), gender, recruiting brigades and battalions, and across education/AFQT/gender groups. Comparisons were also made across fiscal years, for contracts written in FY81, FY82, and the first 6 months of FY83.

Chi-square tests were performed to check for significant¹⁰ differences in contracting outcomes between the different levels of education, AFQT, gender, and length of time in DEP.

Major Findings of the Cohort Loss Analyses

There were five major findings from the cohort loss analyses which were true for contracts written across the three periods. These are as follows:

1. Length of time contracted to be in the DEP is positively related to the loss rate;
2. AFQT categories are differentially related to contracting outcome;
3. Educational levels are differentially related to contracting outcome;
4. Gender is related to contracting outcome; and
5. Educational/AFQT/gender groups manifest different contracting outcomes and different patterns of losses for the contracting month cohorts.

Each of the five findings are discussed in more detail for contracts written in FY81, FY82, and the first six months of FY83 in the subsequent sections.

¹⁰ The term "significant," as used in this report, refers to statistical significance at no less than the $\alpha = .01$ level.

1. Length of Time Contracted to be in the DEP ("DEP Length") is Positively Related to the Loss Rate

Loss rates increased in a stairstep fashion with length of time in the DEP.¹¹ The longer the period contracted to be in the DEP, the greater the proportion of losses. This finding held true for contracts written during FY81, FY82, and the first half of FY83.

In FY82, individuals who contracted to ship out in less than a month had the lowest rate of lost contracts at 1.95%. Individuals with DEP lengths of one month had only a slightly higher loss rate at 2.54%. The longer the contracted DEP lengths became, the higher the loss rates among the contracts (refer to Table 4). This trend is seen across fiscal years 1981, 1982, and early 1983.

Not all of the contracts written during the first 6 months in FY83 had passed their projected active duty dates and so a final determination of the status of all contracts as either accessions or as losses was not possible. For this reason, Table 4 included "open DEP contracts" as disposition status for contracts written during the first 6 months of FY83.

For contracts with contracted DEP lengths of 6 months or less, the percentage of unresolved or "open" contracts remained substantially below 1.0%. The percentage moved up to 2.23% at DEP lengths of 7 months and increased rapidly from that point to a high of 65.8% at DEP length equal to 12 months.

Some proportion of these open contracts will become contract losses and others, accessions. There is no sure way to ascertain that status at this time. Despite this uncertainty, the relationship of increased losses with longer contracted DEP lengths seems to follow the patterns seen in FY81 and FY82. The magnitude of the losses at the longer DEP lengths is not as great for the FY83 contracts as one might expect. This is probably due to the large number of open DEP contracts at the longer DEP lengths.

¹¹ DEP length was calculated as the difference in months between the contract date and the projected active duty date. The data used to make these calculations came from the Mini-master data files. These data were frequently updated and the variable fields overwritten with the new information. Thus, if there were any changes to contractees' originally projected active duty dates, the DEP length calculated would have been the actual time spent in the DEP rather than the time contracted to be in the DEP for those individuals. The original contract date was not supposed to ever have been altered on the file. Thus, the only contractees who would have had their DEP lengths calculated as actual time in DEP (rather than contracted time in DEP) would be DEP sliders, i.e., individuals who renegotiated their original PADD's. This phenomena was further examined in subsequent reports.

Table 4. Percent and number of contract losses across DEP length (for contracts written in FY81, FY82, and the first 6 months of FY83)

DEP Length (in months)	FY81	FY82	FY83	
	% Losses	% Losses	% Losses	% Open DEP Contracts
0	2.51 (402)	1.95 (259)	0.69 (23)	0.24 (8)
1	3.02 (914)	2.54 (752)	2.06 (105)	0.12 (6)
2	5.32 (1,216)	4.44 (1,193)	3.21 (664)	0.13 (26)
3	8.15 (1,292)	5.47 (1,291)	3.58 (717)	0.14 (28)
4	10.42 (980)	8.06 (720)	6.25 (273)	0.30 (13)
5	12.89 (908)	11.21 (864)	8.28 (442)	0.26 (14)
6	14.04 (794)	13.42 (747)	7.70 (375)	0.39 (19)
7	15.95 (876)	13.41 (619)	8.10 (392)	2.23 (108)
8	16.69 (799)	14.18 (656)	8.56 (347)	8.00 (324)
9	19.51 (800)	15.78 (496)	8.55 (245)	11.27 (323)
10	20.66 (756)	16.94 (447)	7.73 (133)	21.74 (374)
11	22.56 (742)	19.07 (533)	9.43 (83)	48.98 (431)
12	22.61 (414)	20.51 (557)	9.96 (46)	65.80 (304)
OVERALL LOSS RATE TOTAL CONTRACT LOSSES	8.40 (10,950)	6.72 (9,162)	4.90 (3,849)	2.53 (1,984)
TOTAL CONTRACTS	130,407	136,264	78,532	
	CHI-SQUARE=6365.858 DF = 12 PROB = 0.0001	CHI-SQUARE=5451.327 DF = 12 PROB = 0.0001	CHI-SQUARE=21977.544 DF = 24 PROB = 0.0001	

2. AFQT Categories are Differentially Related to Contracting Outcomes

Contract losses and accession rates (and for FY83, also the rate of open DEP contracts) differed across the levels of the AFQT. Table 5 presents the loss rates across AFQT categories for each fiscal year. The trend appears to be gradual reductions in loss rates within the same AFQT categories across fiscal years. This is certainly the case between FY81 and FY82. From FY82 to the first half of FY83, the rate of DEP losses appears to be smaller for each category of AFQT. However, this is not clearly the case since some proportion of the open DEP contracts can be expected to result in contract losses.

Contracting outcomes were examined for different AFQT levels. Comparisons were made across pairs of AFQT levels in each of the three fiscal years (see Tables 6A-6C). The specific differences in outcomes between the levels of AFQT varied over the 3 time periods. In FY81, AFQT category IV (and below) had a significantly higher loss rate than levels I, II, IIIA, and IIIB. In FY82 and the first half of FY83, the reverse was found to be the case. One possible explanation for this turnaround is that the length of time that mental category IV individuals were allowed to remain in the DEP was dramatically reduced in FY82 and FY83 from what it had been in FY81.

In FY81, contract loss rates for AFQT levels I, II, IIIA, and IIIB were not found to be significantly different from one another. In FY82 and FY83, mental category IIIB had significantly lower loss rates than category II. Category IIIB also had a significantly lower loss rate than category IIIA in FY83. AFQT level I had a lower loss rate than levels II, IIIA, and IIIB in FY82; category I had a lower loss rate than IIIA in FY83.

It seems that contracts with AFQT levels II and IIIA tended to experience higher loss rates than levels I and IIIB; the loss rate of AFQT categories IV and below appeared to have been controlled by adjusting contracted time in the DEP. This latter finding may also be applicable to other AFQT levels, but due to the lack of substantial changes in their contracted DEP lengths this could not be ascertained.

Table 5. Comparisons of contract losses among AFQT levels (for contracts written in FY81, FY82, and the first half of FY83)

AFQT categories	FY81		FY82		FY83	
	(Frequency/Percent)					
	Losses		Losses		Losses	Open DEP contracts
I	219 7.72		286 6.23		127 4.53	76 2.71
II	2,494 8.35		3,311 7.50		1,405 5.27	831 3.12
IIIA	1,863 8.28		2,292 7.31		1,127 5.77	604 3.09
IIIB	3,446 8.06		2,261 6.96		943 4.45	449 2.12
IV-V	2,964 8.94		1,037 4.36		252 3.01	27 0.32
TOTAL LOSSES	10,986 8.38		9,187 6.74		3,854 4.91	1,987 2.53
TOTAL CONTRACTS	131,109		136,324		78,552	

CHI-SQUARE = 21.125

DF = 4

PROB = 0.0003

CHI-SQUARE = 275.912

DF = 4

PROB = 0.0001

CHI-SQUARE = 368.755

DF = 8

PROB = 0.0001

Table 6A. Comparisons of contracting outcomes among specific AFQT categories
(for contracts written in FY81)

Contract Losses	AFQT Categories							
	I	II	IIIA	IIIB	IV-V	Chi-Square	DF	Probability
	7.72	8.35				1.344	1	0.246
	7.72		8.28			1.050	1	0.306
	7.72			8.06		0.423	1	0.515
	7.72				8.94	4.832	1	0.028
		8.35	8.28			0.077	1	0.782
		8.35		8.06		1.905	1	0.168
		8.35			8.94	6.982	1	0.008
			8.28	8.06		0.934	1	0.334
			8.28		8.94	7.379	1	0.007
				8.06	8.94	18.615	1	0.000
N	219	2,494	1,863	3,446	2,964			

Table 6B. Comparisons of contracting outcomes among specific AFQT categories
(for contracts written in FY82)

Contract Losses	AFQT Categories								
	I	II	IIIA	IIIB	IV-V	Chi-Square	DF	Prob-ability	
	6.23	7.50				9.785	1	0.002	
	6.23		7.31			6.971	1	0.008	
	6.23			6.96		3.350	1	0.067	
	6.23				4.36	30.376	1	0.000	
		7.50	7.31			0.983	1	0.322	
		7.50		6.96		8.042	1	0.005	
		7.50			4.36	254.729	1	0.000	
			7.31	6.96		2.891	1	0.089	
			7.31		4.36	207.556	1	0.000	
				6.96	4.36	168.675	1	0.000	
	N	286	3,311	2,292	2,261	1,037			

Table 6C. Comparisons of contracting outcomes among specific AFQI categories (for contracts written during the first half of FY83)

Contract losses and Open DEP Contracts	AFQI Categories						
	I Losses Open DEP Contracts	II Losses Open DEP Contracts	IIIA Losses Open DEP Contracts	IIIB Losses Open DEP Contracts	IV-V Losses Open DEP Contracts	Chi- Square	Prob- ability DF
	4.53 2.71	5.27 3.12				4.394	2 0.111
	4.53 2.71	5.77 3.09				8.656	2 0.013
	4.53 2.71			4.45 2.12		4.115	2 0.128
	4.53 2.71				3.01 0.32	147.606	2 0.000
		5.27 3.12	5.77 3.09			5.537	2 0.063
		5.27 3.12		4.45 2.12		64.297	2 0.000
		5.27 3.12			3.01 0.32	289.384	2 0.000
			5.77 3.09	4.45 2.12		78.200	2 0.000
			5.77 3.09		3.01 0.32	308.823	2 0.000
				4.45 2.12	3.01 0.32	157.711	2 0.000
N	127 76	1,405 831	1,127 604	934 449	252 27		

3. Educational Levels are Differentially Related to Contracting Outcome

Level of education¹² was operationalized as a two category variable. High school seniors, high school graduates, and persons with education beyond high school comprised one category called graduates/seniors. Persons with the G.E.D. and those with less than a high school education were classified as non-graduates.

The accession status for these two groups was compared across the three time periods. In FY82 and the first 6 months of FY83, the graduates/seniors group had significantly lower loss rates than the non-graduates. For FY81 contracts, the reverse was found to be the case (refer to Table 7). This latter finding could be considered somewhat questionable due to the statistical significance level achieved. For such large numbers of observations, a probability of making a Type I error any greater than 0.01 seems unacceptable as a standard for judging significant differences between groups. The probability of a Type I error is somewhat greater than 0.01 for the comparison of loss rates between the two education groups for FY81 contracts.

The findings for FY82 and FY83 contracts seemed to indicate that contractees at the higher educational levels were less likely to become contract losses than non-high school graduate contractees.

¹² It should be noted that education level was taken from the Mini-master files. This data field was one which often changed over time. When an individual originally contracted for the DEP, his or her current educational status was recorded. At the time of final MEPS processing for accession, any changes in educational status were made permanently on the applicant's file. During this process, the original educational status was lost. For contract losses there was no such updating taking place. Thus, lost contracts appear to be lower in educational level than contract accessions. This however, is an inappropriate conclusion to draw since the education information for losses and accessions was taken at different points in the DEP contracting process. In order to use education level as a predictor of DEP loss and accession, education level at the time of contract signing is a variable which should be used. This was not possible with the FY81 and FY82 Mini-master files. It was not until July 1982, that two education fields were included on the Mini-master file for original and final education levels. Unfortunately, only the final educational level was available to be used in the DEP Loss Analysis.

Table 7. Comparisons of loss rates among aggregated educational levels for contracts written in FY81, FY82, and the first 6 months of FY83

Educational levels	Accession Status			Open DEP contracts
	FY81	FY82	FY83	
	(Percent/Frequency)			
	Losses	Losses	Losses	
Graduates/Seniors	8.46 (9,188)	6.49 (8,107)	4.64 (3,292)	2.66 (1,888)
Non-graduates	7.97 (1,798)	9.48 (1,086)	7.37 (562)	1.30 (99)
TOTAL LOST/OPEN CONTRACTS	8.38 (10,986)	6.74 (9,193)	4.91 (3,854)	2.53 (1,987)
TOTAL CONTRACTS	(131,107)	(136,330)	(78,552)	

CHI-SQUARE = 5.869

DF = 1

PROB = 0.0154

CHI-SQUARE = 149.396

DF = 1

PROB = 0.0001

CHI-SQUARE = 156.554

DF = 2

PROB = 0.0001

4. Gender is Related to Contracting Outcome

Comparing the rate of contract losses for male and female contracts written during FY81, FY82, and quarters 1 and 2 of FY83, females had significantly higher loss rates than males. As Table 8 indicates, female enlistment contracts were lost at more than twice the rate of male contracts. Comparing across the three contracting time periods, the rate of lost contracts appeared to be decreasing for both males and females. This may or may not hold true for FY83 depending upon how the open contracts are resolved and the rate of losses for contracts written during the latter half of the fiscal year.

Table 8. Comparisons of male and female loss rates for contracts written in FY81, FY82, and the first 6 months of FY83

Gender	Accession Status					
	FY81		FY82		FY83	
	(Percent/Frequency)					
	Losses	Losses	Losses	Open		
Females	15.58 (3,506)	14.29 (2,531)	9.91 (1,067)	3.23 (348)		
Males	6.89 (7,480)	5.62 (6,662)	4.11 (2,787)	2.42 (1,639)		
TOTAL LOST/OPEN CONTRACTS	8.38 (10,986)	6.74 (9,193)	4.91 (3,854)	2.53 (1,987)		
TOTAL CONTRACTS	(131,107)	(136,330)	(78,552)			

CHI-SQUARE = 1835.216 CHI-SQUARE = 1845.216 CHI-SQUARE = 705.128
 DF = 1 DF = 1 DF = 2
 PROB = 0.0001 PROB = 0.0001 PROB = 0.0001

Upon further examination, it was discovered that for FY81 and FY82 contracts, females tended to have longer DEP lengths than males. For contracts written during the first 6 months of FY83, however, females were overrepresented at the two shortest DEP lengths (less than a month, and one month) and at the four and five month levels. This is quite a difference from prior years in which females were overrepresented at the longest DEP lengths (refer to Table 9).

Females had significantly higher loss rates than males in the same educational groups (see Table 10). This was true across each of the three contracting time periods. Holding sex constant, there was no significant difference in the loss rates of FY81 and FY82 graduate/senior female and non-graduate female contracts. On the other hand, graduate/senior males had a significantly lower loss rate than non-graduate males contracted during FY81, FY82, and the first 6 months of FY83. The former comparison between non-graduate and graduate/senior females could not be tested for contracts written during the first 6 months of FY83, because the number of non-graduate females was too small (refer to Table 11).

Table 9. Comparisons of the distribution of female (DEP) contracts across DEP length (for contracts written in FY81, FY82, and the first half of FY83)

FY81		FY82		FY83	
DEP length (in months)	(N) (%) Female	DEP length (in months)	(N) (%) Female	DEP length (in months)	(N) (%) Female
Less than 1 month	2,069 12.94	Less than 1 month	1,430 11.02	Less than 1 month	762 22.95
1	3,634 12.00	1	2,280 7.77	1	881 17.29
2	3,518 15.38	2	2,703 10.19	2	2,613 12.63
3	2,122 13.38	3	2,550 10.97	3	2,436 12.16
4	1,638 17.42	4	1,829 20.81	4	747 17.10
5	2,037 28.93	5	1,942 25.61	5	934 17.50
6	1,538 27.19	6	1,445 26.35	6	596 12.25
7	1,905 34.69	7	924 20.34	7	601 12.42
8	1,480 30.92	8	807 17.71	8	507 12.51
9	970 23.66	9	573 18.53	9	328 11.45
10	776 20.96	10	303 11.71	10	190 11.05
11	522 15.87	11	291 10.76	11	106 12.05
12	164 8.96	12	183 7.02	12	61 13.20
Total females	22,373 17.71		17,260 12.88		10,762 13.71
Total contracts	130,389		134,097		78,529

CHI-SQUARE = 4136.325
DF = 12
PROB = 0.0001

CHI-SQUARE = 3945.150
DF = 12
PROB = 0.0001

CHI-SQUARE = 509.905
DF = 12
PROB = 0.0001

Table 10. Comparisons of contract loss rates by gender within aggregated educational levels (for contracts written in FY81, FY82, and the first half of FY83)

	FY81		FY82		FY83 (Q1 & Q2)	
(Frequency/Percent)						
Educational levels	Losers		Losers		Losers	Open DEP contracts
High school graduate/ senior males	5,918 6.75		5,749 5.30		2,253 3.74	1,546 2.57
High school graduate/ senior females	3,270 15.66		2,358 14.33		1,039 9.68	342 3.19
Total lost/open contracts	9,188 8.46		8,107 6.49		3,292 4.64	1,888 2.66
Total contracts	108,555		124,880		70,928	
CHI-SQUARE = 1727.114 DF = 1 PROB = 0.0001						
CHI-SQUARE = 1917.230 DF = 1 PROB = 0.0001						
CHI-SQUARE = 747.601 DF = 2 PROB = 0.0001						
	FY81		FY82		FY83 (Q1 & Q2)*	
(Frequency/Percent)						
Educational levels	Losers		Losers		Losers	Open DEP contracts
Non-high school graduate males	1,562 7.46		913 8.95		534 7.04	93 1.23
Non-high school graduate females	236 14.60		173 13.86		28 80.00	6 17.14
Total lost/open contracts	1,798 7.97		1,086 9.48		562 7.37	99 1.30
Total contracts	22,552		11,450		7,624	

*Some table cells are so sparse that chi-square may not be a valid test.

Table 11. Comparisons of contract loss rates among aggregated educational levels controlling for gender (for contracts written in FY81, FY82, and the first half of FY83)

	FY81	FY82	FY83 (Q1 & Q2)	
(Frequency/Percent)				
Educational levels	Losses	Losses	Losses	Open DEP contracts
High school graduate/senior males	5,918 6.75	5,749 5.30	2,253 3.74	1,546 2.57
Non-high school graduate/senior males	1,562 7.46	913 8.95	534 7.04	93 1.23
Total lost/open contracts	7,480 6.89	6,662 5.62	2,787 4.11	1,639 2.42
Total contracts	108,606	118,624	67,786	
CHI-SQUARE = 13.304 DF = 1 PROB = 0.0003				
CHI-SQUARE = 233.950 DF = 1 PROB = 0.0001				
CHI-SQUARE = 230.834 DF = 2 PROB = 0.0001				
	FY81	FY82	FY83*	
(Frequency/Percent)				
Educational levels	Losses	Losses	Losses	Open DEP contracts
High school graduate/senior males	3,270 15.66	2,358 14.33	1,039 9.68	342 3.19
Non-high school graduate/senior females	236 14.60	173 13.86	28 80.00	6 17.14
Total lost/open contracts	3,506 15.58	2,531 14.29	1,067 9.91	348 3.23
Total contracts	22,501	17,706	10,766	
CHI-SQUARE = 1.265 DF = 1 PROB = 0.2607				
CHI-SQUARE = 0.205 DF = 1 PROB = 0.6508				
CHI-SQUARE = 223.596 DF = 2 PROB = 0.0001				

*Some table cells are so sparse that chi-square may not be a valid test.

In FY81 and FY82, females' contracts had higher loss rates than males at the same AFQT level and in the same educational groups (see Table 1'). Females also tended to have longer DEP lengths than males at the same AFQT levels in the same educational groups. Contracts written during the first half of FY83 for female graduate/seniors did not have longer DEP lengths than their male counterparts; however, their loss rates were still considerably higher than the males. Contracts for non-graduate females in FY83 had longer lengths of DEP and higher loss rates than non-graduate males at the same AFQT levels.

The magnitude of the loss rates for mental category IV non-graduate males and all AFQT levels for non-graduate females was so great that one would have to assume that these individuals were eliminated by the Army and did not drop out of their own volition. The Army does not recruit non-graduate females. The most likely explanation for finding losses in this category is that these individuals signed enlistment contracts as high school seniors, failed to graduate high school, and were subsequently refused enlistment by the Army. The same applies to the mental category IV non-graduate males. The Army does not recruit AFQT level IV non-graduates. The losses from this category probably represent mental category IV high school seniors who did not graduate high school and so were no longer eligible for the Army.

5. Educational/AFQT/Gender Groups Manifest Different Contracting Outcomes

Comparisons were made of the loss rates among subgroups of contracts written during different months of the year. The subgroups consisted of graduate/seniors and non-graduates with AFQT categories I-IIIA, IIIB, and IV (and below), both males and females.

Differences by Education, AFQT, and Gender

The relationship between DEP length and contracting outcome was examined across different educational, AFQT, and gender groups. The relationship was the same for high school seniors and graduates as for non-graduates across the levels of AFQT and for both males and females. The contract accessions in each subgroup had consistently contracted for shorter lengths of time in the DEP than their lost DEP counterparts. This was also true across contract months.

An interesting finding along these same lines has to do with the open DEP contracts written in the first half of FY83. Across contract months, the open DEP contracts resembled the DEP losses in terms of length of DEP more than they did the accessions. In fact, in all the educational/AFQT/gender subgroups for nearly every contract month, the DEP lengths of the open contracts were even longer than those for the lost contracts. If the relationship of DEP length to DEP loss is indeed a predictor of contracting outcome, then one can expect high proportions of the open FY83 contracts to end up as lost enlistment contracts.

Variation in the rate of contract losses by the month of contract signing was tested for each educational/AFQT/gender subgroup. The pattern of losses for the contracting months, however, was not consistent across the three fiscal years for any of the AFQT categories within any education or gender group. Although there did not seem to be a clear pattern of losses by contract month, it was interesting to note that contractees with levels I-IIIA and IIIB were more similar to one another than to the level IV contractees. Similarities were found in their contracted DEP lengths, contract loss rates, percentage of open DEP's, and loss rates by time of contract.

Contracting Cohorts of Graduate/Senior Males

The loss rates for graduate/senior males (GSM) which contracted during FY81 were analyzed by level of AFQT. Loss rates for I-IIIA and IIIB GSM's were lower than for mental category IV GSM's. The DEP lengths for the latter were also longer than those for the former groups.

By FY82, the situation had reversed itself. DEP contracting had changed sufficiently that mental category IV GSM were being contracted for shorter periods than the higher mental category (i.e., I-IIIA, IIIB) GSM. Likewise, the loss rates for level IV GSM were lower than the loss rates for I-IIIA and IIIB GSM.

The same pattern carried over for contracts written during the first 6 months of FY83. Loss rates were lower and DEP lengths shorter for mental category IV GSM than for I-IIIA or IIIB GSM.

The percentage of open contracts and their DEP lengths were also computed for the FY83 contracts. With the exception of mental category IV contracts written in one month (October 1982), the DEP lengths of open contracts were considerably longer than the DEP lengths of lost contracts. This was true across contracting months and across the levels of AFQT. From this, one would tend to expect that the open DEP contracts from FY83 will experience high rates of loss. Not surprisingly, the later in the fiscal year that contracts were written, the higher the percentage of open contracts. The percentage of open contracts varied over the AFQT levels. The I-IIIA GSM's had the highest percent of open contracts ranging from 0.3% for October 1982 contracts to a high of 5.7% for March 1983 contracts. Similarly, the percentage of open contracts ranged from 0.4% to 3.9% for IIIB GSM's. The percentages of open contracts for IV GSM's were substantially smaller than for the higher mental categories ranging only from 0.1% to 0.79%. Again, this finding is probably related to the fact that the mental category IV GSM's have relatively short contracted DEP lengths and thus, the determination of their accession status required less time for maturation.

Table 12. Comparisons of male and female DEP length and loss rates across AFQT levels within educational groups (for contracts written in FY81, FY82, and the first half of FY83)

HIGH SCHOOL GRADUATES AND SENIORS					
FY81					
Males			Females		
AFQT levels	DEP length [(in months)]	Loss rate (in %)	AFQT levels	DEP length [(in months)]	Loss rate (in %)
I-III A (36,825)	3.5	6.5	I-III A (9,394)	4.0	15.7
III B (22,366)	3.7	6.5	III B (7,473)	4.2	15.2
IV (28,479)	3.7	7.3	IV-V (4,018)	4.8	16.5
Overall N=87,670	3.6	6.8	N=20,885	4.2	15.7
FY82					
Males			Females		
AFQT levels	DEP length [(in months)]	Loss rate (in %)	AFQT levels	DEP length [(in months)]	Loss rate (in %)
I-III A (60,364)	3.5	5.4	I-III A (12,666)	4.1	14.7
III B (26,116)	3.6	5.9	III B (3,747)	3.7	12.8
IV (21,937)	2.4	4.2	IV-V (45)	4.1	40.0
Overall N=108,422	3.3	5.3	N=16,458	4.0	14.3
FY83 (Q1 & Q2)					
Males			Females		
AFQT levels	DEP length [(in months)]	Loss rate (in %)	AFQT levels	DEP length [(in months)]	Loss rate (in %)
I-III A (34,681)	4.3	3.9	I-III A (7,758)	4.1	10.8
III B (17,179)	4.2	3.9	III B (2,963)	2.5	6.7
IV (8,337)	2.3	2.9	IV-V (10)	2.4	30.0
Overall N=60,197	4.0	3.7	N=10,731	3.7	9.7

Table 12 (continued)

NON-HIGH SCHOOL GRADUATES					
FY81					
	Males			Females	
AFQT levels	DEP length (in months)	Loss rate (in %)	AFQT levels	DEP length (in months)	Loss rate (in %)
I-III A (8,190)	1.7	7.5	I-III A (805)	2.9	13.2
IIIB (12,141)	1.4	6.2	IIIB (760)	2.7	13.4
IV (605)	4.5	33.1	IV-V (51)	6.4	54.9
Overall N=20,936	1.6	7.5	N=1,616	2.9	14.6
FY82					
	Males			Females	
AFQT levels	DEP length (in months)	Loss rate (in %)	AFQT levels	DEP length (in months)	Loss rate (in %)
I-III A (6,122)	2.7	10.2	I-III A (920)	3.2	13.4
IIIB (2,279)	2.9	8.8	IIIB (325)	2.7	15.4
IV (1,800)	1.7	5.0	IV-V (3)	1.3	0.0
Overall N=10,202	2.6	8.9	N=1,248	3.1	13.9
FY83 (Q1 & Q2)					
	Males			Females	
AFQT levels	DEP length (in months)	Loss rate (in %)	AFQT levels	DEP length (in months)	Loss rate (in %)
I-III A (6,521)	3.2	6.9	I-III A (29)	6.1	75.9
IIIB (1,043)	3.4	7.0	IIIB (6)	4.2	100.0
IV (25)	2.6	44.0	IV-V (0)	---	---
Overall N=7,589	3.2	7.0	N=35	5.8	80.0

Contracting Cohorts of Non-High School Graduate Males

The same types of data were examined for non-high school graduate males (NHSG-M) for the monthly contracting cohorts of FY81, FY82, and the first half of FY83. The highest loss rates and longest DEP lengths for FY81 NHSG-M contracts were for AFQT level IV contracts, followed by levels I-IIIA, and then IIIB. NHSG-M contracts written in FY82 experienced their highest rates of loss among AFQT level I-IIIA contracts, followed by level IIIB, and finally levels IV and below. Length of DEP followed a consistent pattern with longer DEP lengths corresponding to the mental categories with higher loss rates.

Contracts written during the first 6 months of FY83 for NHSG-M's showed the highest rates of contract loss and longest DEP lengths for AFQT level IV's, followed by levels IIIB and I-IIIA. It should be noted, however, that the number of mental category IV NHSG-M's was very small. Thus, the results may not be reliable. The high loss rate among this group may be accounted for by recalling that the Army was not recruiting for this category of contracts. These individuals likely represented AFQT level IV high school seniors who failed to graduate and were subsequently refused Army enlistment.

Contrasts of Graduate/Senior Male Contracts With Non-High School Graduate Male Contracts

The following sums up the differences between the graduate/senior male contracts and the non-high school graduate male contracts:

1. Contracts written in FY81 - GSM contracts tended to have lower loss rates even with longer DEP lengths than NHSG-M's at the same AFQT levels;
2. Contracts written in FY82 - the same pattern displayed for FY81 contracts held true--GSM contracts were written with longer DEP lengths yet experienced fewer losses than NHSG-M contracts at the same AFQT levels; and
3. Contracts written during the first half of FY83 - again, GSM contracts had longer DEP lengths than the NHSG-M contracts yet considerably lower contract loss rates across all AFQT levels except IV. Level IV NHSG-M's contracted for somewhat longer average DEP lengths than GSM IV contracts.

Contracting Cohorts of Graduate/Senior Females

Female contracts were also examined. Graduate/senior female (GSF) contracts written during FY81, FY82, and the first 6 months of FY83 experienced much higher loss rates than GSM contracts at the same AFQT levels. For FY81 and FY82 contracts, the females also had longer DEP lengths than the males. The FY83 GSF contracts had slightly shorter DEP lengths than the GSM contracts.

GSF contracts experienced higher overall rates of loss than either of the male educational groups across all three contracting periods.

The length of time contracted to be in the DEP seemed to have some effect on the loss rates for GSF contracts at AFQT levels I-IIIA and IIIB across the three contracting periods. That is, the shorter the DEP length the lower the loss rate and vice versa. The loss rates for level IV contracts, however, did not demonstrate this same positive relationship between length of DEP and loss rate for contracts written during FY81, FY82, and the first half of FY83. The number of these types of contracts was quite small for FY82 (45) and early FY83 (10) and this casts doubt on the reliability of the analytic findings.

Contracting Cohorts of Non-High School Graduate Females

Non-high school graduate female (NHSG-F) contracts written during FY81 and FY82 experienced higher loss rates than any educational category of males. The DEP lengths of FY81 NHSG-F contracts were longer than those for NHSG-M's at the same AFQT levels but shorter than those for GSF's at the same AFQT levels, except IV. In FY81 the loss rates for level I-IIIA and IIIB NHSG-F contracts were lower than the loss rates for the same mental categories of GSF contracts. In FY82, there were only 3 contracts for NHSG-F's at AFQT level IV, with no losses. In general, the DEP lengths for NHSG-F contracts were shorter than those for GSF contracts. The loss rates were not substantially different.

The number of NHSG-F contracts signed in FY83 ($n=35$) was too small to permit accurate cross-AFQT level comparisons. The rate of losses on this group of contracts was substantial. Since there was no mission for non-high school graduate females in FY83, these individuals were apparently high school seniors who failed to graduate.

General Tendencies from the Contracting Cohort Analyses

The findings from this set of analyses reflected certain patterns. In FY81, the higher AFQT levels tended to have lower rates of contract losses than the lower AFQT levels. This result was reversed for FY82 and early FY83 contracts when the DEP lengths of the AFQT level IV contracts were shortened. Shorter DEP lengths were related to lower loss rates for male contracts and, to a lesser extent, for female contracts. Female contracts were lost at a much higher rate than male contracts. This relationship held true when males and females were matched by educational group and AFQT level and also when the females had equal or somewhat shorter DEP lengths.

Losses by month of contract signing varied randomly across the three fiscal years for male and female contractees in the same educational groups at the same AFQT levels. No patterns could be detected.

Summary of Findings from the Contracting Cohort Loss Analyses

As in the DEP Efficiency Task Force's earlier work on the DEP Loss Analysis, there were numerous variables in the Cohort Loss Analyses which were related to the DEP contract loss rate.

Comparison of cohort loss rates for contracts written during different fiscal years. Comparing DEP cohort loss rates for contracts written in FY81, FY82, and the first six months of FY83 revealed a trend of declining loss rates. A strong caveat to this interpretation of the results relates to the FY83 data. The loss rate for contracts written in the first half of FY83 may be considerably underestimated. The major reason for this underestimation is that there is uncertainty about the final disposition as DEP accessions or DEP losses for some of the contracts. Some percentage of the unresolved cases will become losses. These were not included in the preliminary loss rate estimates. Later analyses comparing characteristics of the unresolved or "open" DEP contracts suggested that the latter tended to resemble lost DEP contracts more than DEP accession contracts. If this is true, then most of the open contracts may become losses thereby increasing the preliminary estimates of loss.

One other possible factor which might be cause for FY83 contract loss rate underestimation is that the analysis focuses on only half of the contracting year. It is uncertain at this point whether individuals contracting later in the year may experience higher rates of loss than those contracting earlier in the year.

The relationship of DEP length to the DEP contract loss rate. The relationship between length of time contracted to be in the DEP and the DEP loss rate was consistent across the three contracting time periods. The longer the contracted length of DEP the higher the loss rate. This relationship was examined across different education/AFQT/gender groups. The results were consistent with the earlier finding; the contract accessions in each of the subgroups had consistently contracted for shorter DEP lengths than their lost DEP counterparts. This was true across all the contracting cohorts.

The open DEP contracts from FY83 had even longer contracted DEP lengths than the DEP loss contracts. This was true across education/AFQT/gender groups and across contract months (October 1982-March 1983).

The relationship between AFQT level and DEP loss rates. There was a lack of consistency in the relationship between level of AFQT and the DEP loss rate across the three contracting time periods.

For FY81 contractees, AFQT levels I, II, IIIA, and IIIB were not significantly different (statistically) from one another in terms of loss rates. Level IV (and below) contractees had significantly higher loss rates than level I, II, IIIA, and IIIB contractees.

This relationship did not hold for FY82 and early FY83 contracts. In fact, AFQT level IV (and below) contracts had the lowest loss rates for FY82 and early FY83 contracts of all AFQT levels. Contractees in the I and IIIB categories tended to experience lower rates of DEP loss than level II and IIIA contractees.

An explanation offered to account for these differences was the change in contracting procedures that took place after FY81 in which mental category IV (and below) contractees were not allowed long stays in the DEP. This drastic reduction in DEP length may account for the equally large reduction in the DEP loss rate among mental category IV contractees.

The relationship between educational level and the DEP loss rate. The education level of DEP contractees was operationalized as non-high school graduates (included G.E.D.'s) and high school graduates/seniors. The FY81 contractees did not show statistically significant differences in contract loss rates. High school graduate/senior contractees in FY82 and early FY83 experienced lower rates of loss than did the non-graduate contractees.

Holding sex constant, there was no significant difference in the loss rates of FY81 and FY82 graduate/senior and non-graduate female contractees. (There was an insufficient number of non-graduate female contracts written in FY83 to be tested for significant differences in loss rates.) Graduate/senior males had significantly lower loss rates than non-graduate males contracted in FY81, FY82, and early FY83.

The relationship between gender and DEP loss rates. Female contractees experienced loss rates more than twice as high as males for contracts written during FY81, FY82, and the first half of FY83.

In FY81 and FY82, female contractees experienced higher loss rates than males at the same AFQT levels and in the same educational groups. Females also tended to have longer DEP lengths than males at the same AFQT levels and in the same educational groups.

Graduate/senior contracts written during the first six months of FY83 did not have longer DEP lengths than their male counterparts; nonetheless, their loss rates were still considerably higher than the males. Non-graduate female contractees from early FY83 had longer DEP lengths and higher loss rates than non-graduate males at the same AFQT levels.

CONCLUSIONS

Use of delayed entry programs by the military will continue to be an important recruiting tool for the all-volunteer services. The vast majority of recruits enter the military via a delayed entry program. It is, therefore, of critical importance that a solid understanding of the system's functioning be established.

Examination of the persons who enter and leave the delayed entry programs provide useful information to those responsible for putting recruits into the service. Different rates of contract loss are associated with a variety of individual-level factors such as educational level, mental category, and gender. Similarly, system-level factors such as recruiting mission, etc., also have an impact on who enters the delayed entry program and the likelihood of accession.

Obviously, economic and other market conditions influence who decides to enlist and who is recruited. Such factors also play a part, no doubt, in which contractees actually enlist.

In this paper, several individual-level characteristics and qualifications, as well as some system-level variables were examined regarding their relationships to contract losses from the Army's Delayed Entry Program (DEP). Factors such as education, mental category, and gender influenced the likelihood of enlistment. The length of time contracted to be in the DEP was related to contract loss and accession rates. This type of information can be used to develop recruiting strategies. Given the Army's recruit manpower requirements, USAREC can adjust missions to take into account the high likelihood of losses from certain types of contractees. Adjustments can be made in the length of time individuals are permitted to be in the DEP, or failing that, a higher percent of contracts than are actually needed should be contracted at the longer DEP lengths.

Before such actions can be recommended, more extensive multivariate analyses need to be undertaken. The simultaneous examination of many different types of factors needs to be performed in order to better interpret how important each variable is in predicting contracting outcomes. Also, the apparent relationship between a dependent variable, such as contracting outcome, and a single independent variable may be negated or may become much less significant when considered in conjunction with other variables. This important analytic process must continue beyond the preliminary work described in this paper.

The findings from the multivariate efforts will be discussed in forthcoming technical reports.

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