

NAVAL POSTGRADUATE SCHOOL MONTEREY, CALIFORNIA



THESIS

AN ANALYSIS OF OFFICER SEPARATION
IN THE ARMY

by

Chul Gyu Cho

March, 1996

Thesis Co-Advisors:

Natalie J. Webb
Mark J. Eitelberg

Approved for public release; distribution is unlimited.

19960607 143

DTIC QUALITY INSPECTED 3

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.

1. AGENCY USE ONLY <i>(Leave blank)</i>	2. REPORT DATE March 1996	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE AN ANALYSIS OF OFFICER SEPARATION IN THE ARMY		5. FUNDING NUMBERS	
6. AUTHOR(S) Chul Gyu Cho		8. PERFORMING ORGANIZATION REPORT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey CA 93943-5000		10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.	
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.		12b. DISTRIBUTION CODE	
13. ABSTRACT <i>(maximum 200 words)</i> This thesis analyzes factors that influence an officer's decision to separate from the Army, after his or her initial obligation, and prior to completing 11 years of service on active duty. Data utilized in this thesis were obtained from the Defense Manpower Data Center (DMDC) Master and Loss Files. Empirical logit models were estimated for officers who entered the Army as an O-1 in 1977, 1980, and 1983. The study also looks exclusively at officers from the three major sources of commission: U.S. Military Academy, Reserve Officers Training Corps, and Officer Candidate School. The results show that the most statistically significant factors affecting an officer's separation decision are the officer's education level and Military Occupational Specialty. The overall results also suggest that female and minority officers had an increased likelihood of leaving the Army during the military drawdown. Recommendations for further study are included.			
14. SUBJECT TERMS Separation, Retention, Army Officer		15. NUMBER OF PAGES 93	16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18 298-102

Approved for public release; distribution is unlimited.

AN ANALYSIS OF OFFICER SEPARATION IN THE ARMY

Chul Gyu Cho
Major, R.O.K. Army
B.S., Korea Military Academy, 1985

Submitted in partial fulfillment
of the requirements for the degree of

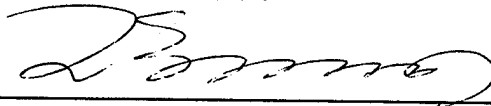
MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL

March 1996

Author:

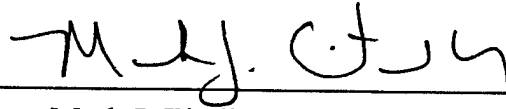


Chul Gyu Cho

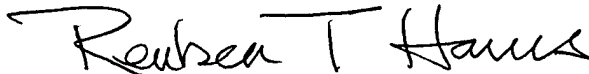
Approved by:



Natalie J. Webb, Thesis Co-Advisor



Mark J. Eitelberg, Thesis Co-Advisor



Reuben T. Harris, Chairman
Department of Systems Management

ABSTRACT

This thesis analyzes factors that influence an officer's decision to separate from the Army, after his or her initial obligation, and prior to completing 11 years of service on active duty. Data utilized in this thesis were obtained from the Defense Manpower Data Center (DMDC) Master and Loss Files. Logit models were estimated for officers who entered the Army as an O-1 in 1977, 1980, and 1983. The study also looks exclusively at officers from the three major sources of commission: U.S. Military Academy, Reserve Officers Training Corps, and Officer Candidate School. The results show that the most statistically significant factors affecting an officer's separation decision are the officer's education level and Military Occupational Specialty. The overall results also suggest that female and minority officers had an increased likelihood of leaving the Army during the military drawdown. Recommendations for further study are included.

TABLE OF CONTENTS

I. INTRODUCTION.....	1
A. SCOPE AND OBJECTIVES.....	2
B. DATA.....	3
C. RESEARCH QUESTIONS.....	3
D. OUTLINE OF STUDY.....	4
II. BACKGROUND/LITERATURE REVIEW.....	5
A. BACKGROUND.....	5
1. Downsizing Effects on the Separation Decision.....	6
2. Decision Point Effects on the Separation Decision.....	8
B. LITERATURE REVIEW.....	10
1. General Turnover Theory.....	10
2. Military Turnover Studies.....	14
3. Literature Summary.....	17
III. METHODOLOGY.....	19
A. SEPARATION PATTERNS OF ARMY OFFICERS	19
B. LOGIT REGRESSION MODEL.....	20
C. NOTIONAL PERSON METHOD.....	22

IV. RESULTS.....	23
A. SEPARATION PATTERNS OF ARMY OFFICERS.....	23
1. General Separation Patterns.....	23
2. Separation Patterns by Gender.....	24
3. Separation Patterns by Race.....	25
4. Separation Patterns by Source of Commission.....	25
5. Separation Patterns by Branch.....	27
6. Separation Patterns by Reasons.....	28
7. Summary of Separation Patterns.....	30
B. LOGIT MODEL.....	30
1. Model Specification.....	30
2. Dependent Variable.....	31
3. Explanatory Variables.....	32
4. Results of the Logit Model.....	33
a. 1977 Cohort.....	33
b. 1980 Cohort.....	35
c. 1983 Cohort.....	36
5. Summary of the Logit Model.....	36
C. NOTIONAL PERSON METHOD.....	38

V. CONCLUSIONS AND RECOMMENDATIONS.....	43
A. CONCLUSIONS.....	43
1. Separation Patterns by Demographic Factors.....	43
2. The Probability of Separation.....	44
3. Notional Person Method.....	44
B. RECOMMENDATIONS.....	45
APPENDIX A. SEPARATION PATTERNS BY SELECTED DEMOGRAPHIC AND CAREER FACTORS.....	47
APPENDIX B. RESULTS OF THE LOGIT MODEL AND NOTIONAL PERSON METHOD.....	63
LIST OF REFERENCES.....	71
INITIAL DISTRIBUTION LIST.....	75

LIST OF TABLES

2-1. Plan for Military Downsizing.....	4
2-2. Correlates of Job Satisfaction.....	7
2-3. Summary of Three Studies: The Effect of Selected Variables on Personnel Turnover.....	13
4-1. Active Duty Service Obligations (ADSO)for Army Officers by Source of Commission and Authority.....	27
4-2. Separation Patterns by Reason for Separation and Entry Cohort (1977, 1980, 1983).....	29
4-3. Changes of the Variables by Entry Cohort (1977, 1980, 1983).....	37
4-4. Changes in Probabilities When Altering the Values of the Explanatory Variables by Entry Cohort (1977, 1980, 1983).....	40
A-1. Separation Rate of Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	48
A-2. Separation Rate of Male Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	49
A-3. Separation Rate of Female Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	50
A-4. Separation Rate of White Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	51

A-5. Separation Rate of Non-White Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	52
A-6. Separation Rate of USMA Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	53
A-7. Separation Rate of ORTC (Scholarship)Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	54
A-8. Separation Rate of ORTC (Non-Scholarship)Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	55
A-9. Separation Rate of OCS Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	56
A-10. Separation Rate of Combat Branch Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	57
A-11. Separation Rate of Combat Support Branch Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	58
A-12. Separation Rate of Combat Service Support Branch Officers Who Were Commissioned as O-1s by Year of Commissioned Service and Entry Cohort (1977, 1980, 1983).....	59
A-13. Separation Frequency (Number) Among Officer Who Were Commissioned as O-1s by Reason for Separation and Year of Commissioned Service, 1977 Cohort.....	60

A-14. Separation Frequency (Number) Among Officer Who Were Commissioned as O-1s by Reason for Separation and Year of Commissioned Service, 1980 Cohort.....	61
A-15. Separation Frequency (Number) Among Officer Who Were Commissioned as O-1s by Reason for separation and Year of Commissioned Service, 1983 Cohort.....	62
B-1. Result of the Estimation of the Model, 1977 Cohort.....	64
B-2. Result of the Estimation of the Model, Including the Higher-Education Variable (PRI_POST) Instead of (POST), 1977 Cohort.....	65
B-3. Result of the Estimation of the Model, 1980 Cohort.....	66
B-4. Result of the Estimation of the Model, Including the Higher-Education Variable (PRI_POST) Instead of (POST), 1980 Cohort.....	67
B-5. Result of the Estimation of the Model, 1983 Cohort.....	68
B-6. Result of the Estimation of the Model, Including the Higher-Education Variable (PRI_POST) Instead of (POST), 1983 Cohort.....	69
B-7. Average Separation Probability and Mean Value of Each Variable by Cohort (1977, 1980, 1983).....	70

ACKNOWLEDGMENTS

My heartfelt thanks are extended to the Republic of Korea (ROK) Army Headquarters and the Naval Postgraduate School (NPS), which have given me a great opportunity to learn, see, and feel new worlds. Several individuals have contributed to this thesis. In particular, I am grateful to my thesis advisors, Professor Natalie J. Webb and Professor Mark J. Eitelberg, for their support and guidance. Without their help, this thesis could not have been completed. In addition, this thesis benefited from the assistance of Helen Davis at the NPS computer center. I would also like to thank my parents, parents-in-law, and my family members for their endless help and encouragement. Finally, I am especially indebted to my wife, Soo-Mi, son, Yun-Hyuck, and daughter, Yun-Seo, for their assistance, great patience, and support during the entire course of my education at NPS, Monterey.

Cho, Chul Gyu

Major, Korean Army

I. INTRODUCTION

The U.S. Army invests substantial funds in recruiting and training personnel each year. This cost is a function of several factors, including: (1) established manning levels; (2) personnel turnover; and (3) the level and mix of skills required to man weapon systems and to meet combat-support requirements. The average training cost-per-soldier has increased over the years due to greater skill requirements and advances in technology. Rising costs of obtaining high-quality soldiers and preparing them for their jobs have consequently placed increasing emphasis on the need to capitalize on personnel investments by controlling turnover (Rashme Lal, 1988).

A study written by Teplitzky (1991) explains the importance of officers' separation decisions in the downsizing as follows:

Millions of dollars are spent annually to attract and train new officers. It costs close to \$200,000 just to send one cadet through West Point, and the Army costs for one ROTC cadet range from \$66,000 to \$80,000. Premature separations not only involve high replacement costs, but also limit the Army's ability to be selective in promoting and assigning junior officers to key leadership positions. Impending budget cuts and mandates to reduce the size of the officer corps make it especially critical that Army manpower planners today understand the factors that influence the career decisions of junior officers.

The factors that influence the separation decision of an Army officer may change from time to time depending on the economic environment, policies, changes in the organization, and individual perceptions. Downsizing, for example, probably affects an officer's decision to stay or leave. Harris (1994) points out that company-grade officers are strongly committed to the

Army. However, these officers are concerned about their career prospects and believe that military downsizing could have a negative impact not only on them, but on the Army as well. It is imperative that the Army address officers' career concerns and provide realistic information to help them make more informed decisions about staying in or leaving the Army. This would reduce the stress and uncertainty that currently exist. Some career issues that seem to be important are promotion potential, assurance of retirement, performance evaluation criteria, expected length of assignments, and changes in the branching process or functional area skills process. Any changes in the career process that would give greater recognition to branch preferences, allow more flexibility in changing branches, or allow more cross-over in skills areas could provide additional benefits in increased satisfaction as well.

A. SCOPE AND OBJECTIVES

This thesis is a statistical analysis of factors related to the separation of Army officers. Specifically, the study examines officers who leave the Army after their initial obligation but prior to completing 11 years of service (promotion to major). The analysis of separation decisions is restricted to company-grade Army officers who were commissioned as O-1s. In general, officers who were commissioned as O-2, O-3, or O-4 are excluded from the analysis, since most of them are doctors, lawyers, or chaplains who have markedly different backgrounds and career experience from other company-grade officers. The study also looks exclusively at officers from the three major sources of commission: the U.S. Military Academy (USMA), Reserve Officers Training Corps (ROTC), and Officer Candidate School (OCS). Separation decisions are important in the early years of an officer's career, because once the officer has

vested 10 or more years of active duty service in the Army, he or she tends to stay in service until retirement (Rashme Lal, 1988).

B. DATA

The separation decisions of officers in three cohorts are examined and compared. The cohorts selected for analysis include officers who began their active military service in 1977, 1982, and 1983.

The data were provided by the Defense Manpower Data Center (DMDC) and cover all service between the year of commission and the end of fiscal 1995. There are 10,107, 10,857, and 10,321 observations in the 1977, 1980, and 1983 cohorts, respectively. As previously noted, the analysis of separation decisions is restricted to company-grade Army officers who were commissioned as O-1s and were commissioned as USMA, ROTC, or OCS graduates. The records are maintained in packed binary format. Some invalid and unknown values are coded as "zero." For this study, invalid and unreasonable data were omitted to estimate the empirical model.

C. RESEARCH QUESTIONS

The primary research questions addressed in the thesis are as follows:

- (1) What factors affect an officer's decision to separate from the Army after the initial obligation but before promotion to major?
- (2) Are there any differences in separation behavior related to an officer's gender or demographic characteristics?

(3) Are there any differences in separation behavior related to an officer's occupational area?

(4) Are there any differences in separation behavior that can be linked to the pre-drawdown, Gulf War, or drawdown periods?

D. OUTLINE OF STUDY

Chapter II briefly explains background, reviews related literature on personnel turnover and military career decisions, and compares turnover experiences in the civilian sector with those in the military. Chapter III describes the analytical approach used in the thesis to examine officers' separation decisions. Chapter IV examines the data and model specified to analyze the separation decision. It also discusses attributes of the data and the steps taken to obtain an adequate sample. Chapter V presents the results of model estimation and concludes with the major findings and recommendations for future research.

II. BACKGROUND/LITERATURE REVIEW

A. BACKGROUND

The last decade has witnessed unprecedented world change. The Cold War ended; Russia and Germany, in particular, have experienced structural, political, and economic instability; and military forces from all over the world came together to stop Iraq's invasion of Kuwait in Operation Desert Shield/Desert Storm. The United States experienced significant economic problems resulting in budget cuts affecting both the public and private sectors, and was changed in many respects. In the military, these budget cuts were particularly critical and called for significant force reductions. Military force reductions were put on hold during Desert Storm, but they began immediately at the end of the war (Harris, 1994). Mackin , Hogan, and Maris (1993) explained this situation as follows:

The U.S. Army faces a critical juncture in the Management of its active-duty commissioned officers. The reduction in external security threats coupled with continuing pressure to reduce the federal budget deficit will inevitably lead to a smaller Army officer corps in the 1990s. While the demand for active-duty officers will decline in the aggregate, individual units in a smaller force must be more flexible and capable of a wider range of tasks and operations. A large number of units specialized to specific functions will be a luxury of the larger force sizes of the past.

During the period of 1980 to 1994, major social and organizational changes occurred that may have affected the career development and perceptions of Army officers, as well as their decisions to remain in service. These topics are addressed below.

1. Downsizing Effects on the Separation Decision

Defense downsizing includes closing bases in the U.S. and Europe and reducing the number of military personnel. At the same time, the Army is dramatically changing the structure and function of its organization (Harris, 1994). Before the current downsizing, officers who volunteered were "promised," directly or indirectly, a career as one of the benefits for taking on a very demanding job. However, the need to reduce the number of Army personnel over a relatively short period has brought about many changes in policy, creating uncertainty for many officers over the prospects of long-term service. These changes have affected perceptions of the Army.

The Army's initial downsizing plan was unveiled in December 1991. The essence of the downsizing plan was that the Army would reduce its force by 25 percent: the FY 1991 active force end-strength of 710,000 would be reduced to an active component of approximately 353,000 by fiscal 1995. Similar reductions would be made in the Army Reserve and National Guard, and all reductions would incorporate officers, warrant officers, enlisted service members, and civilians (Wong and McNally, 1994).

The U.S. Congress has articulated policy objectives to guide force reductions. Section 402 of the National Defense Authorization Act for Fiscal Year 1991 directed the military services to carry out well-balanced force reductions and to limit reductions among career military personnel. The act stipulated that the services could not involuntarily separate military personnel without first having implemented procedures to: (1) limit the number of accessions; (2) increase retirements among those eligible to do so; and (3) limit the number of personnel with more than two, but fewer than six, years of service (GAO, Military Downsizing, 1993).

The Army has various tools to downsize the forces across career groups. These are shown in Table 2-1. The first tool of the plan was to reduce officer accessions. The first component of the involuntary downsizing plan was the Lieutenant Retention Board. In fiscal 1991, the Army selected 83 percent of the lieutenants in year group 1988 for retention, thus involuntarily separating over 700 lieutenants after approximately three years of service. The second component of the involuntary separation plan was a reduction-in-force (RIF) that would target selected cohorts of majors and captains. The voluntary separation plan included three options: a Voluntary Early Release and Retirement Program (VERRP) for individuals who met established criteria; the Voluntary Separation Incentive (VSI), which offered an annual payment equal to 2.5 percent of annual base pay multiplied by years of service, and the annuity would continue for twice the number of years of service; and the Special Separation Benefit (SSB), a lump-sum separation bonus equal to 15 percent of annual base pay multiplied by years of service. In the latter two options, the Army provided active duty service members in certain skill areas a financial incentive to leave (Wong and McNally, 1994, Mehay and Hogan, 1995).

In addition to these downsizing approaches, the Army also offered pre-separation counseling that provided details of all transition benefits, whether voluntary or involuntary; and it offered, for limited and period of time, medical and dental benefit, exchange and commissary privileges, and government housing to officers separation from the Army. The Army Career and Alumni Program (ACAP) also provided relocation and employment assistance to departing officers and their families. Finally, the Army offered a Job Assistance Center (JAC) to help officers with the development of individual job-hunting skills. All of these initiatives were

designed to assist officers with their transition from military to civilian service (Wong and McNally, 1994).

Table 2-1. The Plan for The Military Downsizing

Component	Action
Accession	Reduction of Officer Accessions
Involuntary plan	Lieutenant Retention Board
	Selective Early Retirement Board (SERB)
	Reduction-in-Force (RIF)
Voluntary plan	Voluntary Early Release and Retire Program (VERRP)
	Voluntary Separation Incentive (VSI)
	Special Separation Benefits (SSB)

Source: Wong and Macnally, 1992 and GAO Report, Military Downsizing, 1993

2. Decision Point Effects on the Separation Decision

1995 study (Miller, 1995) found that officer separation behavior could be divided into four distinct phases. The first phase occurs between zero and three years of service and is called the “attrition” phase. The second phase falls between three and approximately 10-11 years of service, and it is called the “early leave decision” phase. It is in this phase that the minimum service requirement expires. The third phase, called the “career decision” phase, appears to be much narrower in time and falls between 10-14 years of service, depending upon branch. It is presumed that the third phase is highly correlated with promotion to O-4 (major). The fourth phase, termed the “late leave decision” phase, coincides with the remainder of an officer’s career

after the early leave decision phase. This phase includes officers with more than 15 years of service and is associated with the 15-year retirement.

The first two phases are somewhat modified in this thesis. The first phase is defined here as between zero and the initial obligation year instead of three years of service. Each officer has a different period of initial obligation depending on his or her source of commission. For example, for the time period under study, officers who were graduates of the U.S. Military Academy had a 5-year initial obligation. ROTC graduates were obligated to serve for 2 to 4 years, depending on the type of program (scholarship or nonscholarship). Officers commissioned through OCS had a 3-year period of initial obligation (Hunter, 1988).

This study assumes that officers have certain decision points during which they can separate from the military. The important decision points are the initial obligation year and the period in which they would be eligible for promotion to major. After the end of the initial obligation, officers can make decisions at various times whether to stay or not. At the same time, once an officer is promoted to major, he or she perceives a "guarantee" of sorts for basic retirement at 20 years. These two points are extremely important for an officer's separation decision. The first is the time between commission and initial obligation, and the second phase is between the initial obligation year and 11 years of service.

This thesis focuses on the second period. The Defense Officer Personnel Management Act (DOPMA) "pin-on" time for major is ten years, plus or minus one year. The Army's average "pin-on" time for major was about 11 years and 11 months in 1992 (Army, Vol.43 , No.1,1992).

B. LITERATURE REVIEW

1. General Turnover Theory

Porter and Steers (1973) examined in detail the research conducted in the decade leading up to the early 1970s. They noted that correlation studies abounded, with considerable evidence that job satisfaction is inversely related to turnover. They classified the contributing factors to job satisfaction into four general areas: organization-wide factors, immediate work environment factors, job-related factors, and personal factors. Their classification is shown in Table 2-2.

Among the organization-wide factors, pay and promotion considerations were the most consistently related to turnover. In particular, a person's met expectations and perceived equity in pay and promotion were seen to interact with the actual pay and promotion rate, leading to feelings of satisfaction or dissatisfaction. Three work environment factors were identified: met expectations of supervisory style, work unit size, and co-worker satisfaction. All of these were shown to be negatively related to turnover. Turnover was seen to be positively correlated with two important job-related factors: task repetitiveness and perceived lack of job autonomy and responsibility. Role clarity was seen to affect satisfaction in two ways. First, realistic job knowledge could screen out, at the employment stage, those who would not be satisfied with the tasks and rewards of the job. Second, accurate role perceptions should act to increase the congruence between actual task and expectations, leading to an increase in satisfaction. In addition, several personal factors have been shown to relate to turnover. For example, age and tenure have been found to be negatively related with turnover. The effects of family size and family responsibilities, however, are not clear (Porter and Steers, 1973).

or her perception and evaluation of available alternatives relative to the present position.

Gerhart (1990) pointed out that models of voluntary turnover specify the important roles of both general labor-market conditions and labor-market perceptions. Although there is consistent support for the role of general labor-market conditions, evidence on perceptions is mixed. In a national sample of young adults, both factors were related to voluntary turnover. However, the two constructs were not closely linked, possibly because labor-market perceptions are based on incomplete information. The study provided the first test of a voluntary turnover model that incorporates both general labor-market conditions and perceived ease of movement, as well as the individual-level variables of general ability and experience. The results were as follows: (1) intention to stay was related to perceived ease of movement and perceived desirability of movement (job satisfaction); (2) voluntary turnover was influenced by unemployment rate and by perceived ease of movement; and (3) the relation between voluntary turnover and unemployment rate was primarily direct, rather than being mediated by perceived ease of movement and intention to stay.

Brett and Reilly's (1988) study used survey data collected from mobile employees and their spouses over a 5-year span to link attitudes, behavioral intent, and actual behavior in a model of the individual job transfer decision. The results showed that the decision to accept or reject a job transfer can be predicted, given information about the employee's willingness to move. In turn, willingness to relocate is associated with some key demographic, career attribute, and attitudinal variables. The major findings from this study were: (1) having many children at home lowered an employee's willingness to move; (2) high job involvement and positive attitudes toward moving raised one's willingness to move; (3) different functional areas varied

significantly with respect to employee willingness to move; (4) and an employee who was willing to relocate was more apt to accept job transfer than one who was not willing to relocate.

Table 2-3. Summary of Three of Studies: The Effect of Selected Variables on Personnel Turnover

Variable	Porter & Steers	Price	Mobley
Personal Characteristic			
Age	CN	CN	CN
Tenure	CN	CN	
Similarity of job with vocational interests	WN		
Personality	WN for extreme traits		
Family size and responsibilities	GP for women; IC for males.		
Sex		IC	IC
Education		WP	IC
Weighted application blank			MP
Overall Job Satisfaction	CN	CN	CN
Organizational and Job Characteristic			
Pay	CN	CN	IC
Promotion	CN	WN	IC
Size of organization	IC	IC	
Size of work unit	CP for blue collar	IC	
Peer group interaction	MN		IC
Integration		CN	
Supervision style	CN		MN
Instrumental communication		CN	
Formal communication		CN	
Role clarity	CN		
Job autonomy and responsibility	CN		
Centralization		CN	
Task repetitiveness	MP	WP	
Overall reaction to job content	CN		CN

Source: Mobley, Griffith, Hand, and Meglino, 1970.

Note: CN, Consistent Negative; MN, Moderate Negative; WN, Weak Negative;

CP, Consistent Positive; MP, Moderate Positive; WP, Weak Positive; IN, Inconclusive.

Table 2-3. Summary of Three of Studies: The Effect of Selected Variables on Personnel Turnover (continue)

Variable	Porter & Steers	Price	Mobley
Occupational grouping			
Blue collar: skilled vs. Unskilled		M (unskilled higher)	
Blue collar vs. white collar		M (blue collar higher)	
Non-managers vs. managers		W (non-managers higher)	
Nongovernment vs. government		W (nongovernment higher)	
Professionalism		WP (professionalism higher)	
External environment			
Level of employment		CP	CP
Perceived alternatives			WP
Recently studied variable			
Intentions to quit			CP
Commitment			CP
Met expectations			WN

Source : Mobley, Griffith, Hand, and Meglino, 1979.

Note: CN, Consistent Negative; MN, Moderate Negative; WN, Weak Negative;

CP, Consistent Positive; MP, Moderate Positive; WP, Weak Positive; IN, Inconclusive.

2. Military Turnover Studies

Military employment has some characteristics not common in the civilian sector. The most obvious is that voluntary separations (quits) are not allowed. By definition, all separations before the end of the obligated term of service are employer-initiated. However, it is probably true that many early discharges are induced by dissatisfied recruits and are disguised "quits." Military attrition and civilian job separations also differ because migration and relocation are more likely associated with military separation (Buddin, 1984).

In the past decade, researchers have analyzed factors that affect the quit/stay decision of civilian and military labor. Analyses of turnover among Army officers is in some ways similar to the analyses of civilian labor turnover and in other ways it is not. As long as officers are perceived as decision-making units, their behavior will be guided by factors similar to any other industrial sector (Rashmi Lal, 1988).

Teplitzky (1991) examined junior Army officer retention using the path analytic model and pointed out that work/family conflict appears to be particularly important in its impact on turnover. Organizational identification also seems to be a promising construct, although it may be less relevant in organizations that are not characterized by a distinctive mission or ideology. Career prospects and work satisfaction demonstrated direct effects on a person's propensity to stay, but year of service had just a small direct effect on propensity to stay.

Roth's research (1980) was motivated by low retention rates among Air Force pilots. He explored several broad factors related to retention and attrition issues and presented a model of career choices based on individual utility maximization. A multivariate probit model was employed in his research, and the core data came from officer personnel records for pilots who began service between 1968 and 1972. Individual characteristics combined with appropriate economic factors in each year were employed in the research model. The model estimated individual characteristics and macro variables. The results indicated that older age at entry, marital status (married), number of dependents, military wage, and the unemployment rate positively affected the retention rate.

Warner and Goldberg (1984) used the Annualized Cost of Leaving (ACOL) model for probit analysis of non-pecuniary factors affecting the retention behavior of Navy first-term enlistees. The ACOL model is used by manpower planners in the Navy to predict the retention rate for persons in various grades and length of service. The ACOL model is based on the enlistee making a choice to stay or leave the Navy after evaluating the utility associated with leaving compared to reenlisting. Utility is composed of two calculated income flows. The first is the present value of the income associated with the outcome of a stay/leave decision. The second is the present value of the non-pecuniary aspects (in monetary terms) of staying or leaving the service. Present and future values of military pay and retirement play an important role in the ACOL model.

Sherman (1993) also used the ACOL model for an "Analysis of Survey Data and Reenlistment Decision Making Model" and examined the effects of the Voluntary Separation Incentive (VSI) and the Special Separation Benefit (SSB) on the separation behavior of soldiers. The results of the study were as follows: (1) Army reenlistment models provide a sound explanatory basis for understanding early separation incentive decision-making; (2) years of service and rank are significantly related to early separation decision-making; (3) years of service and rank could effectively be used as the determining factors in setting the size of early separation incentive offers; and (4) race and gender have not been clearly shown to be determining factors in the early separation incentive decision.

Lal and Lakhani (1990) developed economic, psychological, and sociological data on the retention intentions of junior officers using a DOD survey. The results suggest that the Army can enhance retention by increasing satisfaction with Army life, which, in turn, can be raised by

increasing satisfaction with promotion opportunities, pay and allowances, environment for families, job security, and commissaries. The other variables that correlate positively with retention intentions include years of service and age. The variables that are negatively related to retention concern officers in technical occupations, male officers, and officers who are “likely” or “more likely” to join Army Reserve or National Guard units.

3. Literature Summary

The impetus for this work stems from the important implications of turnover research for both organizations and individuals. For organizations, an understanding of turnover can facilitate efforts to better predict and manage the process. At the same time, the results of turnover research can inform efforts to develop programs and policies that enhance employee satisfaction and career development (Teplitzky, 1991).

Turnover theory (models) in the civilian sector reflect various demographic, economic, sociological, and psychological perspectives. Researchers have examined the separation decision using different approaches and factors in their models. Although they examined the models using different approaches, common study areas can be identified. The first area of turnover research focused on individual-motivated choice behavior. The second area of turnover research focused on consequences for the organization. Both research areas conclude that age, tenure, job satisfaction, the unemployment rate, and satisfaction in present one’s position exert a positive influence on the intention to stay.

Research in the military sector also reflects the special characteristics of military organizations, career, and family life. Separation/retention decisions of military personnel depend not only on monetary compensation but on other factors as well. The major factors that

influence retention decisions appear to be satisfaction with military life, work environment, chance of promotion, potential alternatives in the civilian sector, and employment opportunities for the member's spouse.

III. METHODOLOGY

This thesis uses three different methods to examine the separation decisions of junior-grad Army officers in three cohorts. These include: an analysis of the separation patterns of officers by demographic/career factors; a logit model that estimates the influence of individual characteristics on an officer's decision to separate from the Army ; a "notional person" analysis to examine the effects of changes in each explanatory variable. A more detailed explanation of the methods is presented below.

A. SEPARATION PATTERNS OF ARMY OFFICERS

The separation patterns of Army officers are examined by demographic and career factors. The sample of Army officers was first restricted by availability of data suitable for separation analysis. For example, each demographic variable containing an invalid or unknown value is coded as zero. This study deletes invalid or unknown values when found for gender, race, source of commission, branch, and reason for separation. The following elements were then extracted directly from the Officer Master and Loss Files (maintained by the Defense Manpower Data Center) to identify separation patterns:

- (1) Gender
- (2) Race
- (3) Source of Commission
- (4) Branch [Military Occupational Specialty (MOS)]
- (5) Reason for Separation

Generally, different demographic and social groups have their own distinct patterns of participation with respect to the military's officer corps (Harris, 1994). For example, men are more likely than women to stay in the military for a twenty-year career. Previous research also suggests that certain minorities, such as African-Americans, are more likely than whites to leave the officer corps at certain stages of their military career (Miller, 1995). The separation patterns of company-grade Army officers are also examined using the following comparison groups: men and women; whites and non-whites; academy graduates and officers from other commissioning programs [Reserve Officers Training Corps (ROTC) and Officer Candidate School (OCS)]; officers in combat branches and those in other branches (combat support branch, combat service support branch); and reasons for separation.

B. LOGIT REGRESSION MODEL

The logit model is used to project the probability that company-grade Army officers intend to separate from the Army. This method is commonly used when the dependent variable (separation/non-separation) is binary. The logit model used in this thesis estimates the log of odds ratio in favor of separating from the Army at 10 or fewer years of service.

The basic assumption in this regression model is that the $\log(\text{odds})$ is linearly related to the independent variables. No assumption is made, however, regarding the distribution of the X variables. In fact, a major advantage of this method is that the X variables may be discrete or continuous (Afifi and Clark, 1990).

The model formula is as follows:

$$\ln (P / 1-P) = \frac{1}{1 + \exp[-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_i X_i)]}$$

where, P: the probability of separating

1-P: the probability of not separating

β_0 : the intercept term,

Xs: the explanatory variables,

β s : the coefficient of the explanatory variables,

ϵ_i : the error term.

The interpretation of the logit model is as follows: P is the probability of separating from the Army; and 1-P is the probability of not separating. The coefficient of an explanatory variable measures the change in the log of odds ratio for a unit change in the explanatory variable; that is, it tells how the log-odds in favor of separating from the Army changes as the X variable changes by a unit (Gujarati, 1995). A positive coefficient on a dependent variable increases the log odds ratio in favor of leaving the Army; a negative coefficient decreases the log odds ratio of leaving the Army.

The logit model uses individual observations to estimate the effects of personal characteristics and career factors on separation decisions. It is possible to analyze the effects of demographic and career factors of the cohort with similar attitudes (perspectives) for military service. For this reason, six demographic and two career factors are employed in the logit model.

C. NOTIONAL PERSON METHOD

Results from the logit model (log-odds ratios) show the effects of explanatory variables on the separation decision; however, they do not show how each individual variable affects the likelihood of separation. One method to evaluate the partial effects of the parameters is to develop a “reference” case and then change the value of a single explanatory variable while holding all other variables constant.

This method outlines the effects of changes in each explanatory variable for the notional person. These changes have different numerical values for each different reference. In a situation where the variable has no significant effect, there is no significant difference from the mean or notional person.

IV. RESULTS

This chapter includes results of the three different methods used to analyze the separation decisions of junior-grade Army officers. The chapter is divided into three parts. The first section describes the results of the analysis of separation patterns by demographic/career factors (race, gender, source of commission, MOS, and reason for separation). The second section describes the results of the logit model. The third section describes the results of the notional person analysis.

A. SEPARATION PATTERNS OF ARMY OFFICERS

1. General Separation Patterns

The overall separation patterns of the three cohorts are shown in Table A-1 in Appendix A. As seen in Table A-1, separation rates suddenly increase after three years of service. The major cause of this was the end of the Active Duty Service Obligation (ADSO) of officers in the respective cohorts. Many ADSOs vary according to the program under which the officer was commissioned. For example, USMA graduates incurred a five-year ADSO. ROTC scholarship graduates had a four-year ADSO, non-scholarship ROTC graduates had a three-year ADSO, and OCS graduates incurred a three-year ADSO (Army Regulation 350-100, 1994).

After four or five years of service, separation rates gradually decreased except for the 1983 cohort. In this phase (after four or five years of service), most officers who remain in the Army expect to be selected for major sometime in the future. This expectation encourages them to remain in the military. In the 1983 cohort, however, separation rates did not decrease as much

as in the other two cohorts after six to ten years of completed service. Interestingly, the 1980 cohort has a relatively low separation rate (43.8 percent) after 10 years of service, compared with the other cohorts. Changes in the separation rates across the cohorts may reflect the different political or organizational climates experienced by these groups. The 1983 cohort, for instance, might have been influenced by the military drawdown that occurred during the period examined here.

2. Separation Patterns by Gender

The separation patterns of the three cohorts by gender are shown in Tables A-2 and A-3 in Appendix A. After three years of service, the separation rates for men increased; and, after five years of service, the rates declined dramatically from 6.3 percent and 7.1 percent to 3.9 percent and 4.4 percent for the 1977 and 1980 cohorts, respectively. But the 1983 cohort has the highest separation rates during the same period. Differences were found, however, between male officers and their female counterparts. This may indicate that the separation decisions of female officers were more affected by the military drawdown than were those of their male counterparts.

Generally, the separation rates for female officers were higher than for men, likely due to greater conflicts of women with marriage, family responsibilities, differing rates of selection for promotion, and circumstances problematic to the Army (Hunter, 1988). The separation rates for female officers were comparatively higher at 13.2 percent and 3.8 percent than their male counterparts after 10 years of service in the 1977 and 1980 cohorts, respectively. However, interestingly, in the 1983 cohort, the separation rate of female officers (75.4 percent) was particularly greater than that of their male counterparts (42.8 percent). This difference may be

somehow connected with the force downsizing. It may be that women face different career prospects outside the service.

3. Separation Patterns by Race

The separation patterns of the three cohorts by race are shown in Tables A-4 and A-5 in Appendix A. For the 1977 and 1980 cohorts, the separation rates of nonwhite officers were generally lower than those of white officers, but this changed in the 1983 cohort. When the separation patterns are examined by race for the 1977 and 1980 cohorts, it is found that nonwhite officers had lower separation rates (44.2 percent and 35.4 percents, respectively) than their white counterparts (47.2 percent and 44.3 percent) after 10 years of active service. However, in the 1983 cohort, white officers had a separation rate (59.2 percent) that was lower than that of nonwhite officers (63.8 percent) after the same period of service. This may suggest that nonwhite officers were more affected by the drawdown than were white officers. It may be that nonwhite officers face different career prospects outside the service.

4. Separation Patterns by Source of Commission

The Army operates three primary programs that provide an annual influx of newly-commissioned officers. These are the U.S. Military Academy (USMA), the Reserve Officers Training Corps (ROTC), and Officer Candidate School (OCS). The various officer commissioning programs differ in mission, training, duration, and history, but all three generally require that candidates obtain a college degree before becoming a commissioned officer (GPO report, Officer Commissioning Programs, 1992).

The USMA provides a 4-year undergraduate course of scholastic, military, and physical instruction. The ROTC program is the largest source of commissioned officers. More than 600

colleges and universities throughout the United States have an Army ROTC program. The regular collegiate education provided by these schools is supplemented by military science courses for program participants. The Army provides its ROTC units with a military curriculum, instructors, and summer training, while the colleges and universities provide facilities, utilities, and maintenance. OCS participants are generally college graduates. The Army requires OCS candidates to complete basic training and advanced individual training before entry into OCS (GPO, Officer Commissioning Programs, 1992).

As mentioned previously, Army officers have different ADSOs, based on their source of commission, and these can affect separation decisions. Table 4-1 shows the ADSOs of Army officers based on their source of commission, along with the applicable regulation or US Code. Tables A-6, A-7, A-8, and A-9 in Appendix A demonstrate the relationship between separation rates and ADSOs. For officers from all commissioning programs, it is seen that separation rates increased dramatically after completion of the ADSO.

Tables A-6, A-7, A-8, and A-9 in Appendix A display separation patterns of officers by their sources of commission. All officers exhibit similar behavior based on their commissioning program. Separation rates tend to increase after the last year of obligated service and then decrease gradually. The retention rates of officers from USMA, ROTC without scholarship, and OCS tend to decrease from time to time; but, interestingly, officers who were commissioned through the ROTC under the scholarship program had a high separation rate (61.0 percent) in the 1980 cohort. In addition, it is interesting to observe that officers from OCS had a relatively low separation rate (31.6 percent). All sources of commissioned officers have relatively high separation rates in the 1983 cohort: (ACADEMY: 59.7 percent; ROTC with scholarship:

65.7 percent; ROTC without scholarship: 62.1 percent; and OCS: 52.7 percent).

Table 4-1. Active Duty Service Obligation (ADSO) for Army Officers by Source of Commission and Authority, 1994

Source of Commission		ADSO	Authority
USMA graduates		5 years	10 USC 4348. Notes 1,3
ROTC	Scholarship	4 years	10 USC 2170; AR 145-1. Notes 1,3
	Non-scholarship	3 years	
OCS		3 years	AR 351-5. Notes 1,3,4

Source: AR 350-100: Officer Active Duty Service Obligations, 1994

5. Separation Patterns by Branch

The Army has a number of ways of classifying its branches, but perhaps the most convenient and readily understood categories are Combat, Combat Support, and Combat Service Support (Crocker, 1990). Combat branches are those directly involved in the conduct of actual fighting. These are Infantry, Air Defense Artillery, Field Artillery, Armor, Aviation, Special Forces, and Corps of Engineers. Combat support branches provide operational assistance to the combat branches, including engagement in combat when necessary, and have additional responsibility in providing logistical and administrative support to the Army; these include the Signal Corps, Military Police Corps, Chemical Corps, and Military Intelligence. Finally, the combat service support branches are those whose chief mission is to provide logistical and administrative support and whose personnel are not usually directly engaged in combat operations. These are Adjutant General's Corps, Chaplain Corps, Finance Corps, Judge

Advocate General's Corps, Ordnance Corps, Quartermaster Corps, Transportation Corps, Medical Corps, Dental Corps, Veterinary Corps, Medical Service Corps, Army Nurse Corps, and Army Medical Specialists (Crocker, 1990).

The separation patterns of officers by branch are shown in Tables A-10, A-11, and A-12 in Appendix A. As seen here, there appears to be no significant difference between branches and other categories such as gender, race, and source of commissioning programs. In other words, after 3 years of service, separation rates increase significantly, then decrease gradually until 10 years of service is completed. Interestingly, combat service support branch officers have the highest separation rates after 7-10 years of service in the 1983 cohort. This might be attributed to the different characteristics or perspectives of officers in combat service support during the military downsizing.

6. Separation Patterns by Reasons

Table 4-2 and Tables A-13, A-14, and A-15 in Appendix A show separation patterns by reason for separation. The categories of reasons for separation were extracted from the DMDC Officer Master and Loss Files. The Interservice Separation Codes are defined as follows:

(1) Voluntary release from active duty: expiration of term of service, to attend school or teach, in the national interest, and unqualified resignation; (2) Involuntary release from active service: temporary officer reverts to enlisted status, maximum age of maximum service, and convenience of government; (3) Medical disqualifications: conditions existing before service, disability, and failure to meet weight/body fat standards; (4) Dependency or hardship; (5) Death: battle casualty and non-battle disease; (6) Retirement: 20-30 years of service, over 30 years of service, and failure of selection for promotion; (7) Failure to meet minimum behavioral and performance

criteria: character or behavior disorder, alcoholism, drugs, security, homosexuality, and discreditable incidents; (8) Other separation or discharges: secretarial authority, marriage, conscientious objector, and parenthood; (9) Transactions: change in status and record correction.

Table 4-2. Separation Patterns by Reason for Separation and Entry Cohort (1977, 1980, 1983)

Reasons	Frequency (%)		
	1977	1980	1983
R-1	1829 (60.5)	1575 (82.7)	1473 (83.5)
R-2	53 (2.5)	3 (0.1)	21 (1.3)
R-3	48 (2.3)	54 (2.8)	47 (2.6)
R-4	188 (8.8)	307 (16.1)	122 (6.9)
R-5	22 (1.0)	15 (0.9)	13 (0.7)
R-6	9 (0.5)	5 (0.3)	17 (1.0)
R-7	144 (6.8)	237 (12.5)	167 (9.4)
R-8	11 (0.5)	14 (0.8)	9 (0.5)
R-9	1 (0.1)	3 (0.1)	16 (0.8)
R-10	9 (0.5)	2 (0.1)	0
Total	2129 (100)	1901 (100)	1763 (100)

Source: Derived from data provided by the Defense Manpower Data Center.

R-1: Voluntary release. R-2: Involuntary release. R-3: Medical Disqualifications.

R-4: Dependency or Hardship. R-5: Death. R-6: Retirement. R-7: Failure to Meet Minimum Behavior and Performance Criteria. R-8: Other Separation and Discharge. R-9: Transaction.

R-10: Unknown.

The major reasons for separation of the officers are, in order, voluntary release, dependency or hardship, and failure to meet minimum behavioral and performance criteria. The overall separation reasons are not different among the three cohorts. As seen in Table 4-2, the percentage of voluntary separation rates increased in the 1980 and 1983 cohort by 22.2 percent and 23 percent, respectively. There are no significant differences in the three cohorts.

7. Summary of Separation Patterns

In summary, a comparison of the three cohorts shows that officers generally separate just after the completion of their service obligation. Separation rates then tend to decline until 10 years of service, except for the 1983 cohort. The separation rates after 10 years of completed service are lower for the 1980 cohort than for the other cohorts. During the military downsizing, the separation rates were relatively high, regardless of years of service.

The separation rates of female officers and non-white officers may have been influenced by the military downsizing, based on separation patterns for the cohort. Among the several reasons for separation, the major categories are voluntary release, dependency/hardship, and failure to meet minimum behavioral or performance criteria.

B. LOGIT MODEL

1. Model Specification

This thesis extracted several variables considered to be relevant in estimating the influence of individual characteristics on an officer's decision to separate from the Army. There are six demographic and two career factors.

The model is specified as follows:

$$\text{SEP} = \beta_0 + \beta_1 \text{AAE} + \beta_2 \text{WHITE} + \beta_3 \text{MALE} + \beta_4 \text{DEP} + \beta_5 \text{POST} \\ + \beta_6 \text{ACADEMY} + \beta_7 \text{COMBAT} + \beta_8 \text{ENLIST} + \beta_9$$

where SEP: separating from active duty service

AAE: age at entry

WHITE: white or non-white officer (white=1; nonwhite=0)

MALE: male or female officer (male=1; female=0)

DEP: number of dependents

POST: graduate degree

COMBAT: combat branch (combat=1; noncombat=0)

ENLIST: prior enlistment or warrant officer service

These variables were selected directly from the Active Duty Military Master and Loss Files. The dependent and explanatory variables employed in this thesis are described as follows.

2. Dependent Variable

The logit model restricts the probability of the outcome between 0 and 1. The event is the occurrence of leaving after one's initial obligation, but before promotion to O-4 (before completing 11 years of service). The dependent variable is a binary variable, "yes" or "no." SEP = 1 if the officer separates from the Army after his/her initial obligation year, but before completing 11 years of service; SEP = 0 if the officer does not leave the Army before 11 years

of service.

3. Explanatory Variables

AAE is a continuous variable. It is the officer's age at entry into the military. The age at the time of commissioning varies from 17 to 34 years.

WHITE is divided into two groups. WHITE = 1 if the officer is a member of the majority group (White officer), and WHITE = 0 if the officer is a member of a minority group (Black, Hispanic, Asian, and other minorities).

MALE indicates whether the officer is a man or woman. MALE = 1 if the officer is male and 0 otherwise.

DEP (Number of Dependents) is a continuous variable. This value indicates the number of dependents according to taxable dependency rules. Therefore, an officer who is single has a value=1. If an officer is married and has two family members, a spouse and child, the DEP variable has a value=3.

POST indicates whether the officer earned a graduate degree before leaving the Army. POST = 1 if the officer earned a master's or doctoral degree; otherwise POST is zero.

PRI_POST indicates whether an officer earned a graduate degree before commissioning. PRI_POST = 1 if an officer had a master's or doctoral degree before he/she was commissioned as an officer; otherwise PRI_POST equals zero.

The difference between POST and PRI_POST is the point in time when the officer earned his or her graduate degree. For example, POST represents those who got the degree before they left the Army, either before commissioning or after, PRI_POST represents those who got the degree before they entered the military.

ACADEMY indicates the source of commission. ACADEMY = 1 if the officer was commissioned through one of the military academies, and ACADEMY = 0 if the officer was commissioned through the ROTC or OCS program.

COMBAT represents an officer's branch of service. If an officer's branch is combat (arms), the variable COMBAT takes on the value 1. If the officer's branch is combat support or combat service support, COMBAT equals zero.

ENLIST indicates that an officer had previously served as an enlistee or warrant officer. ENLIST=1 if the officer had prior enlistment or warrant officer service, and ENLIST=0 if the officer did not have prior experience.

4. Results of the Logit Model

As discussed in Chapter III, the models develop the probability of an officer's separation decision, and explain what factors affect that decision.

a. 1977 Cohort

The findings concerning the separation decisions for junior officers in the 1977 cohort are shown in Tables B-1 and B-2 in Appendix B.

Age at entry (AAE) is significant, and has a positive effect on the probability of an officer leaving the Army. It is somewhat surprising to find that AAE has a positive effect on the separation decision. Generally, older people express reluctance to change their job, but AAE has a positive effect on the 1977 cohort.

Race (WHITE) positively affects the separation decision and is statistically significant. This indicates that white officers are more likely to leave the Army than are non-white officers.

The coefficient for gender (MALE) indicates that male officers tend to leave the Army at a higher rate than women; however, it is insignificant in this model.

The number of dependents (DEP) negatively affects an officer's separation decision, and is statistically significant. This means that officers who have many family members --and perhaps, greater family responsibilities-- are more likely to stay in the Army.

The education level (POST) variable has a negative effect on the separation decision for junior officers, and is also statistically significant. This indicates that those who have an advanced degree are less likely to separate from the Army. Not surprisingly, when the model is run with the PRI_POST variable instead of the POST variable, the result is quite different. Table B-2 in Appendix B shows that PRI_POST positively affects the separation decision. It is not surprising that POST has a negative effect on the separation decision, because officers who earned an advanced degree while in active duty service probably are selected for the Army civilian education program. In this case, officers are required to remain on active duty service for three years for each year of schooling (Crocker, 1990). But officers who had advanced degrees before commission (PRI_POST) generally do not stay in the Army. As mentioned previously, the difference of these two variables can be explained as follows: (1) if an officer earned his or her degree before or after commissioning, he or she is captured by the POST variable; (2) however, if an officer earned it before commissioning as an officer, he or she is captured by the PRI_POST variable.

The results indicate that the source of commission variable (ACADEMY) negatively affects an officer's separation decision, but it is insignificant.

The variable COMBAT is a dummy variable where values one and zero indicate, respectively, that the officers are in a combat (arms) or non-combat branch. The coefficient is positive and statistically significant. This indicates that officers in a combat branch more likely to leave the Army.

The results indicate that the variable ENLIST (officers who have prior enlisted or warrant officer service) is significant, and has a negative effect on an officer's turnover decision. Thus, officers who have been an enlistee or warrant officer before being commissioning are likely to stay in the Army.

b. 1980 Cohort

The results of the logit model for the 1980 cohort are shown in Tables B-3 and B-4 in Appendix B.

The results of the 1980 cohort are in many respects similar to those of the 1977 cohort. There are no differences for the WHITE, MALE, POST, DEP, COMBAT, and ENLIST variables between the 1977 and 1980 cohort. A few other variables have a different effect on the separation decision. They are the AAE, PRI_POST, and ACADEMY variables.

AAE and PRI_POST have negative effects on the separation decision, but neither is significant. The variable for U.S. military academy graduates (ACADEMY) has a positive effect on an officer's decision, and is statistically significant. This indicates that those who graduated from USMA are more likely to leave the military.

c. 1983 Cohort

As mentioned in Chapter II, the 1983 cohort may have been influenced by the military downsizing. Therefore, this thesis assumes that some differences between the 1983 year group and the other two groups can be explained by the force drawdown. Tables B-5 and B-6 in Appendix B show the results of the logit model for the 1983 cohort.

The 1983 cohort differed from the 1977 and 1980 cohort in that there was no difference for the DEP, POST, and COMBAT variables. However, the effects of AAE, WHITE, and MALE are changed. Those who were young at entry into the Army (AAE) are more likely to separate. The race (WHITE) variable has a negative effect on the separation decision, but is not significant. The gender (MALE) variable has a negative effect on the separation decision and is statistically significant. This means that male officers are less likely than female officers to leave the military, which is in contrast with the effect found in the other cohorts. In the 1977 and 1980 cohort, the MALE variable has a positive effect, although it is not statistically significant.

5. Summary of the Logit Model

Table 4-3 shows the changes in separation behavior among the three cohorts. It is not easy to explain the trends of separation decisions. Variables that have the same effect on the separation decision in all three cohorts include DEP, POST, COMBAT, and ENLIST. Some variables (AAE and ACADEMY) vary by group, while others, such as the WHITE and MALE are different in the 1983 cohort. In addition, the PRI_POST variable has a different effect in the 1980 and 1983 cohorts.

Table 4-3. The Changes of the variables by Entry Cohort (1977, 1980, 1983)

Variable	1977 Cohort	1980 Cohort	1983 Cohort
AAE	(+)*	(-)	(+)**
WHITE	(+)**	(+)**	(-)
MALE	(+)	(+)	(-)**
DEP	(-)**	(-)**	(-)**
POST	(-)**	(-)**	(-)**
PRI_POST	(+)**	(-)	(-)
ACADEMY	(-)	(+)**	(-)
COMBAT	(+)**	(+)**	(+)**
ENLIST	(-)**	(-)**	(-)**

Source: Derived from data provided by the Defense Manpower Data Center.

(+) indicates a positive effect on the separation decision.

(-) indicates a negative effect on the separation decision.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

The major findings for the logit models are as follows:

(1) The DEP (number of dependents), POST (education level), and ENLIST (experience as an enlistee or warrant officer) variables have a negative effect on the separation decision and are statistically significant. This means that those who have a large family or earn an advanced degree before leaving the Army or have prior service are less likely to separate.

(2) The COMBAT (branch) variable has a positive effect on the separation decision and is also statistically significant. Officers who work in a combat branch are more likely to leave the Army.

(3) The POST (education level before leaving the military) variable has a positive effect on leaving the Army in the 1977 cohort. This means that those who earned an advanced degree before commissioning are more likely to separate from the Army in the 1977 cohort only.

(4) The PRI_POST (education level before commissioning as an officer) variable exhibits an interesting influence. It has a negative effect on the separation decision in the 1977 cohort, but it alters its effect in the 1980 and 1983 cohorts. Even though it is not statistically significant, it has a negative influence on the officer's separation decision. This means officers who earned an advanced degree before being commissioned are more likely to leave the Army.

(5) The WHITE (race) and MALE (gender) variable change only in the 1983 cohort. They exercise a positive effect in the 1977 and 1980 cohorts, but have a negative effect in the 1983 cohort. This may suggest that non-white and female officers have been affected negatively by the military downsizing; consequently, these officers were more likely to leave the Army during the force drawdown.

(6) The AAE (age at entry) and ACADEMY (source of commission) variable vary by cohort. However there is no clear trend.

C. NOTIONAL PERSON METHOD

The notional person method explains the probability of a change in the explanatory variable on the probability of separation. Table B-7 in Appendix B represents the mean

(average) value for each variable and the average separation rates for the three year-groups.

Here, each cohort has all variables set to the mean (average) value in Table B-7 in Appendix B. If the variable is a dummy variable (WHITE, MALE, POST, ACADEMY, COMBAT, and ENLIST), the average value of the variable is set to "zero" or "one." If the variable is continuous (AAE and DEP), the average value of the variable is set to its own mean value. For example, in the 1977 cohort, the AAE variable has the average value 22.59; thus, the average value is set to 22.59. However, the WHITE variable has the average value=0.8; this means that whites represent 80 percent of all officers in 1977 cohort, and in this case, the WHITE variable is set to an average value of 1.

Therefore, in the 1977 cohort, the notional person is a male officer who is white, has 2.82 dependents, was working in a combat branch, is not an academy graduate, had no experience with enlisted service, and was 22.59 years old at his time of entry into the Army. In the 1980 cohort, the notional person was identical to that in the 1977 cohort, except for his age (22.66 years), number of dependents (2.78), and occupation (not in combat branch). In the 1983 cohort, the notional person was also identical to that in 1977 cohort, except for his age (23.17 years), number of dependents (2.57), and occupation (not in combat branch).

Table 4-4 shows the effect of changing the value of a single explanatory variable while holding all other variables constant. For example, in the 1977 cohort, if age at entry increases by one unit, the probability of separation increases by 1.23 percent.

Table 4-4. Changes in Probabilities When Altering the Values of the Explanatory Variables by Entry Cohort (1977, 1980, 1983)

Variable	Percent Changes of Probability		
	1977 Cohort	1980 Cohort	1983 Cohort
AAE	1.23	-0.12	1.54
WHITE	-7.68	-7.77	4.30
MALE	-0.24	-0.62	11.12
DEP	-1.60	-10.1	-10.94
POST	-28.9	-18.55	-30.81
ACADEMY	-1.02	9.27	-7.4
COMBAT	-8.73	9.97	25.03
ENLIST	-14.91	-15.98	-13.41

Source: Derived from Data Provide by the Defense Manpower Center.

Interestingly, among the variables, the strongest effect on the separation decision is obtained from the level of education (POST). This indicates that officers who earned an advanced degree decreased the separation rate by 21.9, 17.5, and 30.81 percent, respectively, across the three entry cohorts. The percentage points of the level of education in the 1988 cohort (30.81 percent) are much higher than that of the other two groups. Experience with enlisted service has a large effect on the separation decision (-14.9, -15.98, and -13.41 percent). A change from combat branch (arms) to noncombat branch also affects the separation probability of an officer by -8.73, 9.97, and 25.03 percent. Race (WHITE), gender (MALE), and source of commission (ACADEMY) tend to have modest effects upon the separation rate (WHITE: -7.68, -7.77, and 4.30 percent; ACADEMY: -1.02, 9.27, and -7.4 percent) when compared with the

other variables. Age at entry (AAE) has a relatively small effect (1.23, -0.12, and 1.54 percent) on the separation rate compared with other variables.

In summary, the level of education (an advanced degree), branch (combat branch), and experience in enlisted service or as a warrant officer have a large effect on an officer's separation decision. Race (white), gender (male), and source of commission (academy graduate) tend to have modest effects, and age at entry has a relatively small effect on the separation decision.

V. CONCLUSIONS AND RECOMMENDATIONS

This thesis examines the separation patterns of officers from the Army by several variables, including race, gender, source of commission, branch, and reasons for separation. The study also explores the relationship between demographic and career factors and the separation decision of junior-grade Army officers using a logit model. In addition, a notional person method is used to estimate the effects of changes in the explanatory variables on the probability of separation from the Army. The major findings of the data analysis are described in Chapter IV. Conclusions drawn from the findings are presented below, followed by several recommendations.

A. CONCLUSIONS

1. Separation Patterns by Demographic Factors

An analysis of the separation rates of Army officers by demographic factors in the three entry cohorts revealed the following:

(1) Generally, the separation rates of Army officers increased soon after their service obligation year and then declined until 10 years of active duty, with the exception of those in the 1983 cohort. In contrast with the two earlier cohorts, the separation rates of the 1983 group did not decrease as much during the 6- to 10-year period. For example, the first two groups have a relatively low separation rate (from 1.3 percent to 5.3 percent) during the 6- to 10-year period, while the rate for the 1983 cohort ranges from 4.2 percent to 7.0 percent.

(2) The separation rates of female and non-white officers were likewise higher in the 1983 cohort than in the earlier cohorts studied. These findings are confirmed in the logit model and notional person analysis of the 1983 cohort. This indicates that female and non-white officers were more likely than their racial or gender counterparts to leave the Army during the military downsizing.

2. The Probability of Separation

It is difficult to generalize about the probability of separation for different demographic groups or cohorts based on the logit models analyzed here. However, some variables were found to consistently affect officers' separation decisions. The combined results of the logit models show the following:

(1) Officers who had a large family, earned an advanced degree (master's or doctoral) before leaving the Army, or had prior service (as an enlistee or warrant officer) were less likely to separate before completing 10 years of service.

(2) Officers who were assigned to combat arms were more likely to leave the Army; and they were also more likely to separate during the military downsizing.

(3) Non-white and female officers in the 1983 cohort were more likely to separate from the Army than were their counterparts in earlier entry groups. The separation probability of these officers shifted from negative to positive during the military downsizing.

3. Notional Person Method

Six demographic and two career variables were examined in a notional person analysis. Among these variables, the greatest effect on the separation decision of Army officers was found for education level (POST). This variable indicates whether an officer earned an advanced

degree, and it changed the probability of separation by 28.9 percent, 18.6 percent, and 30.8 percent, respectively, in each of the three cohorts. A second variable, the officer's branch, also had a great effect on the probability of separation, increasing rates by 8.7 percent, 10 percent, and 25 percent, respectively, in each of the three cohorts. These results suggest that assignment to a combat branch (COMBAT) and education level (POST) -- as well as being non-white or female during the force drawdown-- affect the separation decision.

B. RECOMMENDATIONS

This thesis examines factors that affect officers' separation decisions after their active duty service obligation and prior to promotion to major (10 years of service). The study findings discussed above have identified several demographic factors that are statistically related to the separation decisions. Previous studies have also identified numerous factors that may influence an officer's decisions to leave or remain in the military. These factors include pay, fringe benefits, job security, satisfaction regarding military life or family life, economic environment, and individual preference (Rashmi Lal, 1984; Harris, 1994; Teplitzky, 1991; and Hunter/Holz/Eaton, 1988). As seen in this thesis, which focuses on three cohorts, factors that may affect an officer's separation decision often change from time to time, along with changes in personnel policies and other environmental influences.

One study (Harris, 1994) points out that when officers see high-quality soldiers leave (during the force drawdown), they tend to believe that effectiveness and readiness are degraded. As mentioned in Chapter I, turnover in the officer corps not only creates personnel management problems, but it also affects the training and working environment in the Army. To maintain the

pyramid-type of rank structure of the forces (fewer officers at higher ranks, many more at lower ranks), future studies should address the issue of separation.

**APPENDIX A: SEPARATION PATTERNS BY SELECTED DEMOGRAPHIC
AND CAREER FACTORS**

This appendix contains tables showing separation rates by selected demographic and career groups (race, gender, source of commission, branch, and reason for separation). These tables are discussed in Chapter IV.

Table A-1. Separation Rate of Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	24 (0.5)	80	10 (0.2)	83	3 (0.1)
1	78	123 (2.7)	81	46 (1.1)	84	14 (0.5)
2	79	260 (5.8)	82	142 (3.3)	85	75 (2.5)
3	80	419 (9.3)	83	424 (9.7)	86	343 (11.7)
4	81	427 (9.4)	84	324 (7.5)	87	264 (9.0)
5	82	301 (6.7)	85	299 (6.9)	88	280 (9.5)
6	83	176 (3.9)	86	228 (5.3)	89	149 (5.1)
7	84	144 (3.2)	87	201 (4.6)	90	167 (5.7)
8	85	127 (2.8)	88	146 (3.4)	91	123 (4.2)
9	86	70 (1.6)	89	90 (2.1)	92	206 (7.0)
10	87	58 (1.3)	90	92 (2.1)	93	139 (4.9)
Leaver	2,129 (47.1)		1,901 (43.8)		1,763 (60.6)	
Stayer	2,394 (52.9)		2,777 (63.9)		1,181 (39.4)	
Total	4,523 (100)		4,340 (100)		2,944 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-2. Separation Rate of Male Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	23 (0.5)	80	8 (0.2)	83	3 (0.1)
1	78	117 (2.7)	81	40 (1.1)	84	8 (0.3)
2	79	232 (5.4)	82	112 (2.9)	85	59 (2.3)
3	80	381 (8.0)	83	279 (7.6)	86	284 (11.1)
4	81	399 (9.3)	84	272 (7.2)	87	207 (8.1)
5	82	284 (6.6)	85	270 (7.1)	88	252 (9.9)
6	83	165 (3.9)	86	192 (5.1)	89	122 (4.8)
7	84	135 (3.2)	87	167 (4.4)	90	140 (5.5)
8	85	120 (2.8)	88	122 (2.1)	91	107 (4.2)
9	86	67 (1.6)	89	77 (2.1)	92	166 (6.5)
10	87	56 (1.3)	90	78 (2.1)	93	118 (4.63)
Leaver	1,979 (46.2)		1,610 (42.6)		1,466 (57.5)	
Stayer	2,305 (53.2)		2,169 (57.4)		1,034 (42.5)	
Total	4,284 (100)		3,779 (100)		2,550 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-3. Separation Rate of Female Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	1 (0.4)	80	2 (0.4)	83	0 (0.0)
1	78	6 (2.5)	81	6 (1.1)	84	6 (1.5)
2	79	28 (11.7)	82	7 (1.3)	85	16 (4.1)
3	80	38 (15.9)	83	36 (6.4)	86	59 (15.0)
4	81	20 (8.4)	84	52 (9.3)	87	57 (14.5)
5	82	17 (7.1)	85	29 (5.2)	88	28 (7.1)
6	83	11 (4.6)	86	36 (6.4)	89	27 (6.9)
7	84	9 (3.8)	87	41 (7.3)	90	27 (6.9)
8	85	7 (2.9)	88	24 (4.3)	91	16 (4.1)
9	86	3 (1.3)	89	13 (2.3)	92	40 (10.2)
10	87	2 (0.8)	90	14 (2.5)	93	21 (5.3)
Leaver		142 (59.4)		260 (46.4)		297 (75.4)
Stayer		97 (40.6)		301 (52.6)		97 (24.6)
Total		239 (100)		561 (100)		394 (100)

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-4. Separation Rate of White Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	16 (0.4)	80	9 (0.2)	83	3 (0.1)
1	78	108 (2.8)	81	35 (0.9)	84	14 (0.6)
2	79	190 (4.5)	82	109 (2.8)	85	60 (2.4)
3	80	353 (9.3)	83	280 (7.3)	86	287 (11.6)
4	81	386 (10.1)	84	303 (7.9)	87	230 (9.3)
5	82	268 (7.0)	85	279 (7.3)	88	239 (9.7)
6	83	147 (3.9)	86	206 (5.4)	89	133 (5.4)
7	84	129 (3.4)	87	177 (4.6)	90	135 (5.4)
8	85	108 (2.9)	88	131 (3.4)	91	98 (3.9)
9	86	60 (1.6)	89	79 (2.1)	92	164 (6.6)
10	87	48 (1.3)	90	82 (2.2)	93	107 (4.3)
Leaver	1,813 (47.6)		1,690 (44.3)		1,470 (59.2)	
Stayer	1,995 (52.4)		2,125 (56.7)		1,015 (40.8)	
Total	3,808 (100)		3,815 (100)		2,485 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-5. Separation Rate of Non-White Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	8 (1.1)	80	1 (0.2)	83	4 (0.1)
1	78	15 (2.1)	81	11 (2.1)	84	12 (2.5)
2	79	70 (9.8)	82	25 (4.8)	85	15 (3.3)
3	80	66 (9.2)	83	26 (4.9)	86	40 (8.7)
4	81	41 (5.7)	84	21 (4.0)	87	34 (7.4)
5	82	33 (4.6)	85	20 (3.8)	88	41 (8.9)
6	83	29 (4.1)	86	22 (4.2)	89	16 (3.5)
7	84	15 (2.1)	87	24 (4.6)	90	32 (7.0)
8	85	19 (2.7)	88	15 (2.9)	91	25 (5.5)
9	86	10 (1.4)	89	11 (2.1)	92	42 (9.1)
10	87	10 (1.4)	90	10 (1.9)	93	32 (6.9)
Leaver		316 (44.2)		186 (35.4)		293 (63.8)
Stayer		399 (55.8)		339 (64.6)		166 (36.2)
Total		715 (100)		525 (100)		459 (100)

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-6. Separation Rate of USMA Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	0 (0.0)	80	0 (0.0)	83	0 (0.0)
1	78	0 (0.0)	81	7 (0.9)	84	1 (0.1)
2	79	4 (0.6)	82	7 (0.9)	85	11 (1.4)
3	80	3 (0.4)	83	2 (0.2)	86	10 (1.3)
4	81	7 (1.0)	84	13 (1.6)	87	21 (2.8)
5	82	116 (16.9)	85	160 (19.2)	88	176 (23.5)
6	83	54 (7.9)	86	76 (9.1)	89	71 (9.5)
7	84	38 (5.6)	87	49 (5.9)	90	58 (7.7)
8	85	26 (3.8)	88	30 (3.6)	91	27 (3.6)
9	86	18 (2.6)	89	18 (2.2)	92	42 (5.6)
10	87	9 (1.3)	90	9 (1.1)	93	31 (4.1)
Leaver	275 (40.1)		371 (44.4)		448 (59.7)	
Stayer	410 (59.9)		464 (55.6)		302 (40.3)	
Total	685 (100)		835 (100)		750 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-7. Separation Rate of ROTC (Scholarship) Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	8 (0.6)	80	3 (0.4)	83	2 (0.5)
1	78	13 (1.0)	81	6 (0.7)	84	3 (0.7)
2	79	12 (1.0)	82	23 (2.7)	85	9 (2.2)
3	80	70 (5.3)	83	46 (5.4)	86	29 (7.2)
4	81	314 (23.8)	84	221 (26.0)	87	115 (28.4)
5	82	96 (7.3)	85	113 (13.3)	88	21 (5.2)
6	83	57 (4.3)	86	33 (3.5)	89	18 (4.4)
7	84	46 (3.5)	87	30 (3.5)	90	19 (4.7)
8	85	36 (2.7)	88	15 (1.8)	91	12 (2.9)
9	86	14 (1.1)	89	18 (2.1)	92	16 (3.9)
10	87	17 (1.3)	90	10 (1.2)	93	22 (5.4)
Leaver	683 (51.9)		518 (61.0)		266 (65.7)	
Stayer	633 (48.1)		331 (39.0)		139 (34.3)	
Total	1,316 (100)		849 (100)		405 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-8. Separation Rate of ROTC (Non-Scholarship) Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	15 (0.8)	80	7 (0.3)	83	1 (0.1)
1	78	82 (4.3)	81	32 (1.4)	84	10 (0.9)
2	79	222 (11.7)	82	236 (10.3)	85	41 (3.6)
3	80	257 (13.5)	83	175 (7.7)	86	196 (17.2)
4	81	85 (4.5)	84	121 (5.3)	87	101 (8.9)
5	82	75 (4.0)	85	106 (4.5)	88	60 (5.3)
6	83	52 (2.7)	86	90 (4.0)	89	42 (3.7)
7	84	45 (2.4)	87	82 (3.6)	90	59 (5.2)
8	85	53 (2.8)	88	105 (4.6)	91	52 (4.6)
9	86	32 (1.7)	89	47 (2.1)	92	90 (7.9)
10	87	21 (1.1)	90	64 (2.8)	93	54 (4.7)
Leaver		939 (49.4)		1,065 (46.9)		706 (62.1)
Stayer		962 (50.6)		1,202 (53.1)		431 (37.9)
Total		1,901 (100)		2,267 (100)		1,137 (100)

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-9. Separation Rate of OCS Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	1 (0.2)	80	0 (0.0)	83	0 (0.0)
1	78	28 (4.5)	81	1 (0.3)	84	5 (0.1)
2	79	22 (3.5)	82	5 (1.4)	85	14 (2.2)
3	80	89 (14.3)	83	42 (10.2)	86	103 (16.5)
4	81	21 (3.4)	84	13 (3.0)	87	27 (4.1)
5	82	14 (2.3)	85	6 (1.5)	88	23 (3.5)
6	83	13 (2.1)	86	8 (2.1)	89	18 (2.8)
7	84	15 (2.4)	87	20 (5.1)	90	31 (4.8)
8	85	12 (1.9)	88	11 (2.8)	91	32 (4.9)
9	86	6 (1.0)	89	7 (1.8)	92	58 (8.9)
10	87	11 (1.8)	90	9 (2.3)	93	32 (4.9)
Leaver		232 (37.4)		122 (31.6)		343 (52.7)
Stayer		389 (62.6)		267 (68.4)		309 (47.3)
Total		621 (100)		389 (100)		652 (100)

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-10. Separation Rate of Combat Branch Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	1 (0.1)	80	1 (0.1)	83	0 (0.0)
1	78	72 (2.9)	81	9 (0.5)	84	5 (0.4)
2	79	165 (6.7)	82	27 (1.3)	85	50 (3.5)
3	80	276 (11.2)	83	56 (2.6)	86	221 (15.4)
4	81	266 (10.8)	84	194 (9.1)	87	133 (9.3)
5	82	181 (7.4)	85	159 (7.5)	88	180 (12.5)
6	83	97 (4.0)	86	148 (7.0)	89	93 (6.5)
7	84	90 (3.7)	87	116 (5.5)	90	104 (7.2)
8	85	75 (3.1)	88	81 (3.9)	91	63 (4.4)
9	86	40 (1.6)	89	51 (2.4)	92	97 (6.8)
10	87	29 (1.2)	90	54 (2.5)	93	58 (4.0)
Leaver	1,292 (52.6)		896 (42.3)		1,004 (67.4)	
Stayer	1,164 (47.4)		1,226 (57.7)		481 (32.4)	
Total	2,456 (100)		2,122 (100)		1,485 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-11. Separation Rate of Combat Support Branch Officers who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	0 (0.0)	80	0 (0.0)	83	0 (0.0)
1	78	3 (0.6)	81	1 (0.2)	84	4 (0.8)
2	79	19 (3.9)	82	3 (0.5)	85	8 (1.6)
3	80	38 (7.4)	83	10 (1.7)	86	40 (8.6)
4	81	31 (6.1)	84	41 (7.1)	87	54 (11.6)
5	82	21 (4.1)	85	30 (5.2)	88	23 (4.9)
6	83	17 (3.3)	86	19 (3.3)	89	18 (3.9)
7	84	9 (1.8)	87	25 (4.3)	90	21 (4.5)
8	85	19 (3.7)	88	21 (3.7)	91	17 (3.7)
9	86	7 (1.4)	89	9 (1.6)	92	33 (7.1)
10	87	7 (1.4)	90	8 (1.4)	93	20 (4.3)
Leaver	171 (33.4)		167 (29.9)		238 (51.2)	
Stayer	341 (66.6)		412 (71.1)		227 (48.8)	
Total	512 (100)		579 (100)		465 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-12. Separation Rate of Combat Service Support Branch Officers Who Were Commissioned as O-1s by Years of Commissioned Service and Entry Cohort (1977, 1980, 1983)

Years of Commissioned Service (completed)	1977 Cohort		1980 Cohort		1983 Cohort	
	FY	Frequency (%)	FY	Frequency (%)	FY	Frequency (%)
Less than 1	77	23 (1.5)	80	9 (0.6)	83	3 (0.3)
1	78	48 (3.1)	81	36 (2.2)	84	9 (0.9)
2	79	76 (4.9)	82	49 (2.9)	85	13 (1.3)
3	80	105 (6.8)	83	119 (7.2)	86	82 (7.9)
4	81	130 (8.4)	84	189 (11.5)	87	67 (6.4)
5	82	99 (6.4)	85	110 (6.7)	88	67 (6.4)
6	83	62 (4.0)	86	61 (3.7)	89	38 (3.7)
7	84	45 (2.9)	87	60 (3.7)	90	52 (4.9)
8	85	33 (2.1)	88	44 (2.7)	91	53 (5.0)
9	86	23 (1.4)	89	30 (1.8)	92	76 (7.3)
10	87	22 (1.5)	90	30 (1.8)	93	61 (5.9)
Leaver	666 (42.9)		737 (44.9)		521 (50.0)	
Stayer	888 (57.1)		902 (55.1)		521 (50.0)	
Total	1,554 (100)		1,639 (100)		1,041 (100)	

Source: Derived from data provided by the Defense Manpower Data Center.

Table A-13. Separation Frequency (Number) Among Officers Who Were Commissioned as O-1s by Reason for Separation and Year of Commissioned Service, 1977 Cohort

Years of Commissioned Service (completed)	FY	R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9	R-10
		Frequency (%)									
Less than 1	77	7	0	1	16	1	0	13	2	0	0
1	78	105	2	4	11	4	0	6	1	0	0
2	79	220	19	5	11	2	0	8	1	0	4
3	80	380	16	3	16	2	0	12	2	0	4
4	81	408	2	3	14	3	0	10	0	0	0
5	82	261	13	5	21	3	3	12	2	1	1
6	83	142	0	6	28	1	2	22	3	0	0
7	84	128	0	5	11	1	0	10	0	0	0
8	85	93	0	7	27	3	1	23	0	0	0
9	86	52	1	5	12	1	1	11	0	0	0
10	87	33	0	4	21	1	3	17	0	0	0
Sub-Total		1,829 (60.5)	53 (2.5)	48 (2.3)	188 (8.8)	22 (1.0)	9 (0.5)	144 (6.8)	11 (0.5)	1 (0.01)	9 (0.5)
Total Leaver		2,129 (100)									

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Reason for Separation (R-1 through R-10) is defined in Chapter IV.

Table A-14. Separation Frequency (Number) Among Officers Who Were Commissioned as O-1s by Reason for Separation and Year of Commissioned Service, 1980 Cohort

Years of Commissioned Service (completed)	FY	R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9	R-10
	Frequency (%)										
Less than 1	80	0	0	1	0	0	0	8	1	0	0
1	81	9	0	9	28	1	0	25	2	0	0
2	82	13	0	0	29	4	0	22	3	0	0
3	83	171	0	1	13	1	0	19	1	1	1
4	84	308	2	3	65	2	1	34	2	0	1
5	85	372	0	6	48	2	0	16	2	0	0
6	86	262	1	6	37	1	1	21	2	1	0
7	87	172	0	14	25	4	0	20	0	1	0
8	88	145	0	7	13	0	0	12	0	0	0
9	89	90	0	3	22	0	0	22	0	0	0
10	90	92	0	4	41	0	3	38	0	0	0
Sub-Total		1,575 (82.7)	3 (0.1)	54 (2.8)	307 (16.1)	15 (0.5)	5 (0.2)	237 (12.5)	14 (0.5)	3 (0.1)	2 (0.1)
Total Leaver		1,901 (100)									

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Reason for Separation (R-1 through R-10) is defined in Chapter IV.

Table A-15. Separation Frequency (Number) Among Officers Who Were Commissioned as O-1s by Reason for Separation and Year of Commissioned Service, 1983 Cohort

Years of Commissioned Service (completed)	FY	R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9	R-10
		Frequency (%)									
Less than 1	83	1	0	0	2	1	0	1	0	0	0
1	84	4	1	2	7	0	0	5	1	1	0
2	85	46	0	7	22	4	0	15	1	0	0
3	86	313	2	6	22	1	1	18	1	0	0
4	87	223	4	7	30	0	1	28	0	1	0
5	88	246	0	5	29	2	1	23	2	1	0
6	89	129	0	7	13	2	1	7	3	0	0
7	90	131	1	5	30	2	0	26	0	2	0
8	91	83	11	4	25	0	1	16	1	7	0
9	92	177	2	1	26	0	2	20	0	4	0
10	93	120	0	3	16	0	10	6	0	0	0
Sub-Total		1,473 (83.5)	21 (1.2)	47 (2.6)	222 (12.6)	13 (0.7)	17 (1.0)	165 (9.4)	9 (0.5)	16 (1.2)	0 (0.0)
Total Leaver		1,763 (100)									

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Reason for Separation (R-1 through R-10) is defined in Chapter IV

APPENDIX B: THE RESULTS OF THE LOGIT MODEL AND NOTIONAL PERSON METHOD

This appendix presents the results of the logit model, showing separation probabilities by entry cohort. Also shown are the average separation rates and mean values of each explanatory variable included in the notional person method.

Table B-1. Results of the Estimation of the Model, 1977 Cohort

Variable	Parameter Estimate	Wald Chi-Square	Pr> Chi-Square
AAE	0.049*	5.253	0.021
WHITE	0.306**	8.402	0.004
MALE	0.009	0.003	0.954
DEP	-0.667**	476.761	0.001
POST	-1.335**	170.184	0.001
PRI_POST	N.A.		
ACADEMY	-0.041	0.163	0.686
COMBAT	0.355**	21.859	0.001
ENLIST	-0.623*	4.238	0.039
OBSERVATION	3,915		
LEAVER	1,561		
BASE PROBABILITY OF LEAVING	39.87 (%)		
CONCORDANCE RATE	77.5 (%)		

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Variable Definitions are presented in Chapter IV.

N.A. indicates variable not included in model.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

Table B-2. Results of the Estimation of the Model, Including the Higher-Education Variable (PRI_POST) Instead of (POST), 1977 Cohort

Variable	Parameter Estimate	Wald Chi-Square	Pr> Chi-Square
AAE	0.028	1.805	0.179
WHITE	0.227*	4.848	0.027
MALE	-0.041	0.066	0.796
DEP	-0.6756**	516.305	0.001
POST	N.A.		
PRI_POST	0.7110**	14.1605	0.001
ACADEMY	-0.097	0.989	0.319
COMBAT	0.515**	48.993	0.001
ENLIST	-0.516	2.993	0.083
OBSERVATION	3,915		
LEAVER	1,561		
BASE PROBABILITY OF LEAVING	39.87 (%)		
CONCORDANCE RATE	74.9 (%)		

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Variable Definitions are presented in Chapter IV.

N.A. indicates variable not included in model.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

Table B-3. Results of the Estimation of the Model, 1980 Cohort

Variable	Parameter Estimate	Wald Chi-Square	Pr> Chi-Square
AAE	-0.006	0.058	0.808
WHITE	0.406**	10.775	0.001
MALE	0.029	0.071	0.789
DEP	-0.547**	319.78	0.001
POST	-1.207**	115.33	0.001
PRI_POST	N.A.		
ACADEMY	0.412**	19.734	0.001
COMBAT	0.441**	34.121	0.001
ENLIST	-0.982**	12.092	0.001
OBSERVATION	4,030		
LEAVER	1,329		
BASE PROBABILITY OF LEAVING	32.97 (%)		
CONCORDANCE RATE	74.8 (%)		

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Variable Definitions are presented in Chapter IV.

N.A. indicates variable not included in model.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

Table B-4. Results of the Estimation of the Model, Including the Higher-Education Variable (PRI_POST) Instead of (POST), 1980 Cohort

Variable	Parameter Estimate	Wald Chi-Square	Pr> Chi-Square
AAE	-0.017	0.606	0.436
WHITE	0.370**	9.197	0.002
MALE	0.112	1.057	0.303
DEP	-0.562**	345.368	0.001
POST	N.A.		
PRI_POST	-0.364	0.3844	0.3424
ACADEMY	0.329**	13.372	0.001
COMBAT	0.573**	60.356	0.001
ENLIST	-0.949**	11.619	0.001
OBSERVATION	4,030		
LEAVER	1,329		
BASE PROBABILITY OF LEAVING	32.97 (%)		
CONCORDANCE RATE	72.7 (%)		

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Variable Definitions are presented in Chapter IV.

N.A. indicates variable not included in model.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

Table B-5. Results of the Estimation of the Model, 1983 Cohort

Variable	Parameter Estimate	Wald Chi-Square	Pr> Chi-Square
AAE	0.063**	8.351	0.003
WHITE	-0.179	1.877	0.171
MALE	-0.479**	9.2469	0.002
DEP	-0.478**	164.491	0.001
POST	-1.895**	189.48	0.001
PRI_POST	N.A.		
ACADEMY	-0.105	0.795	0.372
COMBAT	0.678**	48.6416	0.001
ENLIST	-0.538**	7.516	0.006
OBSERVATION	2,409		
LEAVER	1,389		
BASE PROBABILITY OF LEAVING	57.65 (%)		
CONCORDANCE RATE	78.0 (%)		

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Variable Definitions are presented in Chapter IV.

N.A. indicates variable not included in model.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

Table B-6. Results of the Estimation of the Model, Including the Higher-Education Variable (PRI_POST) Instead of (POST), 1983 Cohort

Variable	Parameter Estimate	Wald Chi-Square	Pr> Chi-Square
AAE	0.051*	6.059	0.013
WHITE	-0.188	2.305	0.128
MALE	-0.465*	9.802	0.002
DEP	-0.506**	199.28	0.002
POST	N.A.		
PRI_POST	-0.529	1.916	0.166
ACADEMY	-0.228*	4.651	0.031
COMBAT	0.873**	89.501	0.001
ENLIST	0.454*	5.562	0.018
OBSERVATION	2,409		
LEAVER	1,389		
BASE PROBABILITY OF LEAVING	57.65 (%)		
CONCORDANCE RATE	73.0 (%)		

Source: Derived from data provided by the Defense Manpower Data Center.

Note: Variable Definitions are presented in Chapter IV.

N.A. indicates variable not included in model.

** indicates significant at 0.01 level.

* indicates significant at 0.05 level.

TableB-7. Average Separation Probability and Mean Value of Each Variable by Cohort
(1977, 1980, 1983)

Variable	Mean (average) Value			Description
	1977 Cohort	1980 Cohort	1983 Cohort	
AAE	22.59	22.66	23.17	Age at Entry
WHITE	1	1	1	1= White Officer 0= Non-White Officer
MALE	1	1	1	1= Male Officer 0= Female Officer
DEP	2.82	2.78	2.57	Number of Dependents
POST	0	0	0	1= Postgraduate Education level 0= Non-Postgraduate
ACADEMY	0	0	0	1= Academy Graduates 0= Non-Academy Graduates
COMBAT	1	0	0	1= Combat Branch 0= Non-Combat Branch
ENLIST	0	0	0	1= Enlist Experience 0= Non-Enlist Experience
Average Probability of Separation Rate	49.49 %	39.83 %	57.96 %	

Source: Derived from data provided by the Defense Manpower Data Center.

LIST OF REFERENCES

Affi, A.A. and Virginia Clark, "Computer Aided Multivariate Analysis, Second Edition," Chapman and Hall, New York, 1990.

Brett, Jeanne M. and Anne H. Reilly, "On the Road Again: Predicting the Job Transfer Decision," *Journal of Applied Psychology*, Vol. 73, No.4, 1988, pp. 614-620.

Buddin, Robert, "Analysis of Early Military Attrition Behavior," RAND Corporation, Santa Monica, CA, 1984.

Byrne, Brian James, "An Evaluation of Artificial Neural Network Modeling for Manpower Analysis," Master's Thesis, Naval Postgraduate School, Monterey, Ca, September 1993.

Campion, Michael A., "Meaning and Measurement of Turnover: Comparison of Alternative Measures and Recommendations for Research," *Journal of Applied Psychology*, Vol. 76, No. 2, 1991, pp. 199-212.

Eastman, William John, "Marine Officer Attrition Model," Master's Thesis, Naval Postgraduate School, Monterey, Ca, June 1984.

Gerhart, Barry, "Voluntary Turnover and Alternative Job Opportunities," *Journal of Psychology*, Vol. 75, No.5, 1990, pp. 467-476.

Harris, Beverly C., "Perceptions of Army Officers in a Changing Army," U.S. Army Research Institute for the Behavioral and Social Sciences, Alexandria, Virginia, 1994.

Hayden, Lewell P., "Factors Influencing the Career Orientation of Junior Officers in the United States Army," Master's Thesis, Naval Postgraduate School, Monterey, Ca, March 1985.

Hollenbench, John R. and Charles R. Williams, "Turnover Functionality Versus Turnover Frequency: A note on Work Attitudes and Organizational Effectiveness," *Journal of Applied Psychology*, Vol. 71, No. 4, 1986, pp. 606-611.

Hunter, Fumiyo T., Robert F. Holz, and Newell K. Eaton, "Tenure Patterns of U.S. Commissioned Officers in the 1970s and 1980s," (AD-A197 603) U.S. Army Research Institute, 1988.

Kaspar, Donna M., "The Effects of the Drawdown on Promotion and Career Opportunities of Female Officers," Master's Thesis, Naval Postgraduate School, Monterey, Ca, March 1995.

Lakhani, Hyder A. and Rashmi Lal, "A Model of Employment Decision Making: An Analysis of Quit/Stay Decisions of Junior Army Officer," EER Technologies Corporation, 1988.

Miller, Brian D., "The Impact of the Drawdown on Minority Officer Retention," Master's Thesis, Naval Postgraduate School, Monterey, Ca, March 1995.

Mobley, William H., "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," *Journal of Applied Psychology*, Vol. 62, No. 2, 1977, pp. 237-240.

Mobley, William H., R. W. Griffeth, H. H. Hand, and B. M. Meglino, "Review and Conceptual Analysis of the Employee Turnover Process," *Psychological Bulletin*, Vol. 86, No. 3, 1979, pp. 493-522.

National Defense Research Institute, "Future Career Management Systems for U.S. Military Officers," MR-470-OSD RAND Corporation, Santa Monica, Ca, 1994.

Porter, Lyman W. and Richard M. Steers, "Organizational, Work, and Personal Factors in Employee Turnover and Absenteeism," *Psychological Bulletin*, Vol. 80, No. 2, 1973, pp. 151-176.

Stolzenberg, Ross M. and John D. Winkler, "Voluntary Termination from Military Service," (AD-A154 941) RAND Corporation, Santa Monica, Ca, June 1985.

Teplitzky, Martha L., "Junior Army Officer Retention Intentions: A Path Analysis Model," U.S. Army Research Institute for the Behavioral and Social Sciences, Alexandria, Virginia, 1991.

U.S. Department of the Army, "Officer Active Duty Service Obligations," Army Regulation 350-100, 1994.

U.S. Department of the Army, "Military Occupational Classification Structure Development and Implementation," Army Regulation 611-1, 1995.

U.S. Department of the Army, "Military Occupational Classification and Structure," Update 12-6, Government Printing Office, Washington, D.C., 1995.

U.S. General Accounting Office, "Military Downsizing: Balancing Accessions and Losses is key to Shaping the Future Force," Government Printing Office, Washington, D.C., 1993.

U.S. General Accounting Office, "Officer Commissioning Programs: More Oversight and Coordination Needed," Government Printing Office, 1992.

Youngblood, Stuart A., William H. Mobley, and Bruce M. Meglino, "A Longitudinal Analysis of the Turnover Process," *Journal of Applied Psychology*, Vol. 68, No. 3, 1983, pp. 507-516.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center 2
8725 John J. Kingman Rd., STE 0944
Ft. Belvoir, Virginia 22304-6145

2. Dudley Knox Library 2
Naval Postgraduate School
411 Dyer Rd.
Monterey, California 93943-5101

3. Dr. Natalie J. Webb (Code 64 We) 2
Defense Resources Management Institute
Naval Postgraduate School
Monterey, California 93943-5101

4. Dr. Mark J. Eitelberg (Code SM/Eb) 2
Department of Systems Management
Naval Postgraduate School
Monterey, California 93943-5101

5. Major. Cho, Chul Gyu 2
Jung-Hwa APT 4B-102,
Kyunggi-do, Buchun-si, Wonmi-dong
421-102
Republic of Korea

6. Woodang Library 2
Korea Military Academy
P.O. Box 77, Gongneung-dong
Nowon-gu, Seoul, 139-799
Republic of Korea
7. LTC. Park, Bongsuk 2
Education Office, Deputy Chief of Staff-Personnel
P.O.Box 4, Bunam-ri, Duma-myun
Nonsam-gun, Choongchung-nam do, 320-919
Republic of Korea