

2

DTIC FILE COPY

# NAVAL POSTGRADUATE SCHOOL Monterey, California

AD-A199 304



## THESIS

DTIC  
SELECTED  
SEP 12 1988  
D

AN ANALYSIS OF RETENTION OF FIRST-TERM  
ENLISTED PERSONNEL IN THE SELECTED RESERVES

by

Donald D. Fithian, Jr.

June 1988

Thesis Co-advisors:

George W. Thomas  
Stephen L. Mehay

Approved for public release; distribution is unlimited

88 9 12 05 5

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION <b>UNCLASSIFIED</b>		1b RESTRICTIVE MARKINGS	
2a SECURITY CLASSIFICATION AUTHORITY		3 DISTRIBUTION AVAILABILITY OF REPORT Approved for public release; distribution is unlimited	
2b DECLASSIFICATION/DOWNGRADING SCHEDULE			
4 PERFORMING ORGANIZATION REPORT NUMBER(S)		5 MONITORING ORGANIZATION REPORT NUMBER(S)	
6a NAME OF PERFORMING ORGANIZATION Naval Postgraduate School	6b OFFICE SYMBOL (If applicable) Code 54	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School	
6c ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000		7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000	
8a NAME OF FUNDING SPONSORING ORGANIZATION	8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c ADDRESS (City, State, and ZIP Code)		10 SOURCE OF FUNDING NUMBERS	
		PROGRAM ELEMENT NO	PROJECT NO
		TASK NO	WORK UNIT ACCESSION NO
11 TITLE (Include Security Classification) AN ANALYSIS OF RETENTION OF FIRST-TERM ENLISTED PERSONNEL IN THE SELECTED RESERVES			
12 PERSONAL AUTHOR(S) Fithian, Donald D., Jr.			
13a TYPE OF REPORT Master's Thesis	13b TIME COVERED FROM TO	14 DATE OF REPORT (Year, Month, Day) 1988, June	15 PAGE COUNT 111
16 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.			
17 COSATI CODES		18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
		Retention; Reenlistment Intentions; Selected Reserve Participation; Military Turnover; Reserve Affiliation; Military Manpower Planning; Reserve Manpower Analysis, <i>Thesis</i>	
19 ABSTRACT (Continue on reverse if necessary and identify by block number) This thesis analyzes retention decisions of male, first-term enlisted Selected Army Reservists. The likelihood of retention is analyzed with the conditional logistic regression (logit) model using a dichotomous choice of intentions (stay/leave) for various Reserve sub-populations: non-prior and prior active service groups for National Guard and Army Reserve components. The relative importance of various demographic, military experience and cognitive/perceptual factors to the retention decision is assessed. The results highlight potential policy variables which can be impacted by manpower policy planners to manage Reserve force retention. <i>Keywords</i>			
20 DISTRIBUTION AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a NAME OF RESPONSIBLE INDIVIDUAL Prof. George W. Thomas		22b TELEPHONE (Include Area Code) (408) 646-2741	22c OFFICE SYMBOL Code 54Te

Approved for public release; distribution is unlimited

An Analysis of Retention of First-term  
Enlisted Personnel in the Selected Reserves

by

Donald D. Fithian, Jr.  
GS-13, United States Army  
B.S., Old Dominion University, 1976

Submitted in partial fulfillment of the  
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL  
June 1988

Author:

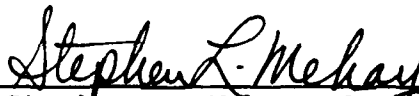


Donald D. Fithian, Jr.

Approved by:



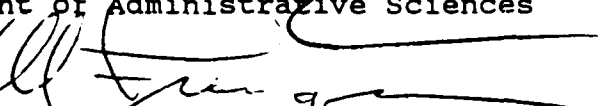
George W. Thomas, Thesis Advisor



Stephen L. Mehay, Co-advisor



David R. Whipple, Jr., Chairman  
Department of Administrative Sciences



James M. Fremgen  
Acting Dean of Information and Policy Sciences

ABSTRACT

This thesis analyzes retention decisions of male, first-term enlisted Selected Army Reservists. The likelihood of retention is analyzed with the conditional logistic regression (logit) model using a dichotomous choice of intentions (stay/leave) for various Reserve sub-populations: non-prior and prior active service groups for National Guard and Army Reserve components. The relative importance of various demographic, military experience and cognitive/perceptual factors to the retention decision is assessed. The results highlight potential policy variables which can be impacted by manpower policy planners to manage Reserve force retention.

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



TABLE OF CONTENTS

I.	INTRODUCTION -----	1
	A. FORCE STRUCTURE -----	2
	B. READINESS -----	6
	C. ARMY RESERVE COMPONENTS -----	7
II.	LITERATURE REVIEW AND THEORETICAL FRAMEWORK -----	10
	A. CAUSAL RELATIONSHIPS -----	10
	B. BEHAVIORAL THEORY -----	16
	C. SUMMARY -----	26
III.	DESCRIPTION OF DATA AND METHODOLOGY -----	28
	A. RESEARCH OBJECTIVES -----	28
	B. THE 1986 RESERVE COMPONENTS SURVEY -----	29
	C. HYPOTHESIZED TURNOVER PROCESS MODEL -----	35
	D. VARIABLE SELECTION -----	36
	E. RESEARCH HYPOTHESES AND METHODOLOGY -----	46
IV.	DATA ANALYSIS -----	48
	A. DATA LIMITATIONS -----	48
	B. DATA RESTRICTIONS -----	49
	C. BIVARIATE ANALYSIS -----	50
	D. FACTOR ANALYSIS -----	56
	E. MODEL ESTIMATION -----	61
	F. MODEL RESULTS -----	65
	G. ASSESSMENT OF MODEL VALIDITY -----	77

V.	CONCLUSIONS AND RECOMMENDATIONS -----	81
A.	CONCLUSIONS -----	82
B.	IMPLICATIONS -----	84
C.	RECOMMENDATIONS FOR FURTHER STUDY -----	88
APPENDIX:	LOGIT MODEL OF RETENTION, BY RESERVE COMPONENT, BY NON-PRIOR AND PRIOR ACTIVE SERVICE GROUP -----	91
	LIST OF REFERENCES -----	93
	BIBLIOGRAPHY -----	96
	INITIAL DISTRIBUTION LIST -----	102

LIST OF TABLES

1.1	MILITARY RESERVE FORCES, STRENGTH (AS OF MARCH 1987) -----	3
1.2	MAJOR ELEMENTS OF THE FORCE STRUCTURE, BY SERVICE (AS OF MARCH 1987) -----	4
2.1	CORRELATES OF TURNOVER -----	16
3.1	BASIC SAMPLE OF MILITARY MEMBERS SELECTED FOR THE 1986 RESERVE COMPONENTS SURVEYS -----	32
3.2	1986 RESERVE COMPONENTS SURVEYS RESPONSE RATES FOR MILITARY MEMBERS, BY RESERVE COMPONENTS -----	34
3.3	1986 RESERVE COMPONENTS SURVEY, FREQUENCIES FOR RESPONSES TO THE QUESTION, "HOW LIKELY ARE YOU TO REENLIST OR EXTEND AT THE END OF YOUR CURRENT TERM OF SERVICE?" -----	37
3.4	1986 RESERVE COMPONENTS SURVEY, DEMOGRAPHIC CHARACTERISTICS, BY NON-PRIOR AND PRIOR ACTIVE SERVICE -----	39
3.5	1986 RESERVE COMPONENT SURVEY, MILITARY EXPERIENCE CHARACTERISTICS, BY NON-PRIOR AND PRIOR ACTIVE SERVICE -----	42
3.6	1986 RESERVE COMPONENTS SURVEY, DESCRIPTION OF CANDIDATE COGNITIVE/PERCEPTUAL VARIABLES -----	44
3.7	1986 RESERVE COMPONENTS SURVEY, DESCRIPTION OF CANDIDATE SPOUSE AND PRIMARY EMPLOYER ATTITUDES TOWARD GUARD/RESERVE PARTICIPATION -----	47
4.1	CROSS TABULATION OF INTENT TO REENLIST OR EXTEND BY SELECTED EXPLANATORY VARIABLES, BY RESERVE COMPONENT FOR THE NON-PRIOR ACTIVE SERVICE GROUP -----	51
4.2	CROSS TABULATION OF INTENT TO REENLIST OR EXTEND BY SELECTED EXPLANATORY VARIABLES, BY RESERVE COMPONENT FOR THE PRIOR ACTIVE SERVICE GROUP -----	54

4.3	FACTOR LOADING FOR VARIABLES, RELATIVE TO THE REASONS PEOPLE PARTICIPATE IN THE GUARD/RESERVE -	57
4.4	FACTOR LOADING FOR VARIABLES, RELATIVE TO HOW MUCH OF A PROBLEM AS EXPRESSED IN THE MEMBER'S OPINION, SPECIFIC FEATURES ARE IN MEETING UNIT'S TRAINING OBJECTIVES -----	59
4.5	FACTOR LOADING FOR VARIABLES, CONCERNING THE MEMBERS' OPINION OF SPECIFIC FACETS OF THEIR RESPECTIVE UNIT -----	60
4.6	FACTOR LOADING FOR VARIABLES, CONCERNING THE MEMBERS' SATISFACTION WITH SPECIFIC FEATURES OF THE GUARD/RESERVE -----	61
4.7	REFERENCE INDIVIDUALS BY NON-PRIOR AND PRIOR ACTIVE SERVICE GROUP -----	64
4.8	VALUE CODING OF THE EXPLANATORY VARIABLES -----	64
4.9	RETENTION PROBABILITIES, BY RESERVE COMPONENT, BY NON-PRIOR ACTIVE SERVICE GROUP -----	67
4.10	RETENTION PROBABILITIES, BY RESERVE COMPONENT, BY PRIOR ACTIVE SERVICE GROUP -----	68
4.11	CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED REENLISTMENT INTENTION FOR THE ARMY NATIONAL GUARD, NON-PRIOR ACTIVE SERVICE GROUP --	78
4.12	CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED REENLISTMENT INTENTION FOR THE ARMY RESERVE, NON-PRIOR ACTIVE SERVICE GROUP -----	78
4.13	CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED REENLISTMENT INTENTION FOR THE ARMY NATIONAL GUARD, PRIOR ACTIVE SERVICE GROUP -----	79
4.14	CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED REENLISTMENT INTENTION FOR THE ARMY RESERVE, PRIOR ACTIVE SERVICE GROUP -----	79
A.1	LOGIT MODEL OF RETENTION, BY RESERVE COMPONENT, BY NON-PRIOR AND PRIOR ACTIVE SERVICE GROUP -----	92



LIST OF FIGURES

2.1	Motowidlo and Lawton Model (1984)	-----	15
2.2	Mobley, et al., Model (1978)	-----	22
2.3	Miller, et al., Model (1979)	-----	22
2.4	Dalessio, et al., Model (1986)	-----	23
2.5	Mobley, et al., Model (1979)	-----	24
2.6	Bluedorn Model (1979)	-----	24
2.7	Steers and Mowday Model (1981)	-----	25
2.8	Arnold and Feldman Model (1982)	-----	26
3.1	Hypothesized Turnover Process Model	-----	36
5.1	Final Turnover Process Model	-----	81

## I. INTRODUCTION

In August 1973, Defense Secretary Schlesinger directed the services to integrate the Active and Reserve component forces into a total force. As he stated in the GAO report on Total Force Management dated January 1979,

Total Force is no longer a concept. It is now the Total Force Policy which integrates the Active, Guard, and Reserve forces into a homogenous [sic] whole.

Key to the national security planning of the United States under the All-Volunteer Force is the concept of the total force. For the United States military, the planning considerations in support of national strategy mean integration of both the Active and Reserve forces. The Department of Defense faces a major management problem when integrating these forces so as to maintain an effective military force that can be mobilized and deployed rapidly. Rising manpower costs and increasing competition for funds underscore the importance of good management within the Department of Defense.

In a major military confrontation such as with WARSAW Pact forces in Europe, the Department of Defense is dependent upon rapid mobilization and deployment of Reserve forces to provide sustaining power. Immediate Reserve contribution would come from Selected Reserve units and individual replacement personnel from within the Individual Ready Reserve. Therefore, it is absolutely essential that

the Reserve components be fully manned and combat ready at all times.

#### A. FORCE STRUCTURE

How have the Reserves fared since the end of conscription? This is a question that has been asked many times, and the answer can sometimes be misleading. Although the numbers of reservists are important to Congress and military manpower analysts, they say very little about military capability. The portion of the weight borne by the Reserves can be assessed more realistically in terms of "force structure" or symbols of military force capability. Table 1.1 shows recent strength levels by Reserve component. The major elements of the Reserve force structure are summarized in Table 1.2.

As alluded to in Table 1.1, reservists are not only associated with one of the seven components listed, but are also identified with one of three categories: Ready Reserve, Standby Reserve and Retired Reserve. The Ready Reserve is composed of Reserve units and personnel who are considered available for immediate mobilization in the event of a national emergency, that is the Selected Reserve and Individual Ready Reserve. The former was created by the Congress in the Reserve Forces Bill of Rights and Vitalization Act of 1967, and is characterized by the following: (a) it is composed exclusively of organized Reserve units, (b) all members drill periodically in paid

TABLE 1.1

## MILITARY RESERVE FORCES, STRENGTH (AS OF MARCH 1987)

Category	Actual Strength
<u>Selected Reserve</u>	
Army National Guard	452,557
Army Reserve	310,793
Naval Reserve	146,427
Marine Corps Reserve	41,447
Air National Guard	114,166
Air Force Reserve	79,270
Subtotal	1,144,660
<u>Individual Ready Reserve/ Inactive National Guard</u>	
Army National Guard	9,627
Army Reserve	305,582
Naval Reserve	70,430
Marine Corps Reserve	47,803
Air National Guard	0
Air Force Reserve	46,796
Subtotal	480,238
<u>Standby Reserve</u>	
Army Reserve	350
Naval Reserve	11,281
Marine Corps Reserve	1,691
Air Force Reserve	24,958
Subtotal	38,280
<u>Retired Reserve</u>	
Army Reserve	462,369
Navy Reserve	351,880
Marine Corps Reserve	68,880
Air Force Reserve	507,352
Subtotal	1,390,481
<u>Total DOD Reserve Strength</u>	3,053,659
Coast Guard Reserve	17,874

Source: Compiled from data appearing in the Defense Almanac, Department of Defense, September/October 1987, pp. 26-39.

TABLE 1.2

MAJOR ELEMENTS OF THE FORCE STRUCTURE,  
BY SERVICE (AS OF MARCH 1987)

Army Reserve\*

2 Armored divisions  
5 Infantry divisions  
2 Mechanized divisions  
3 Armored brigades  
7 Mechanized brigades  
11 Infantry brigades  
4 Cavalry regiments  
1 Light infantry division  
1 Infantry group (scout)

Naval Reserve

1 Destroyer  
18 Minesweepers  
11 Frigates  
2 Amphibious types  
2 Support ships  
10 Fighter/attack squadrons  
13 Patrol squadrons  
1 Strike/fighter squadron  
15 Logistics/support squadrons  
  
2 Early warning squadrons  
2 Tactical/electronic warfare squadrons

Marine Corps Reserve

1 Division  
1 Aircraft wing

Air Force Reserve

45 Tactical fighter squadrons  
11 Fighter intercept squadrons  
34 Tactical airlift squadrons  
17 Air refuel squadrons  
4 Strategic airlift squadrons  
17 Strategic airlift squadrons (associate)  
6 Tactical reconnaissance squadrons  
1 Aeromedical airlift squadron (associate)  
3 Air refuel squadrons (associate)  
3 Tactical air support squadrons  
5 Air rescue squadrons  
3 Special operations squadrons

\* Major combat units only

Source: Compiled from data appearing in the Defense Almanac, Department of Defense, September/October 1987, p. 44.

drill positions, (c) it is composed entirely of "volunteers" and (d) its strength is authorized annually by the Congress.

Personnel not assigned to organized units, but who are considered available for immediate mobilization in the event of a national emergency are referred to as Individual Ready Reserve. This category was created in 1952 by the Armed Forces Reserve Act and consists of a pool of individual trained reservists, who, when mobilized, would be utilized as individual reinforcements or replacements to Active Army or Reserve units. These reservists are mostly members who are fulfilling their six-year military service obligations.

Not more than one million members of the Ready Reserve may be on active duty without their consent (other than for training). They may be ordered to active duty in time of national emergency as declared by the President, or when otherwise authorized by law, for not more than 24 consecutive months.

The Standby Reserve consists of individuals who have completed their Ready Reserve requirement and have been transferred to the Standby Reserve after performing a combination of Active duty and required service in a Ready Reserve component. Since this group has little impact on the defense budget, Congress does not limit the number of Standby Reserves. Members of the Standby Reserve may be ordered to Active duty (other than for training) only in time of war, or national emergency declared by Congress, or

when otherwise authorized by law, for the duration of the war or emergency and for six months thereafter.

The Retired Reserve consists of individuals who have by law or regulations satisfied the requirements for retirement from the military. A member of the Retired Reserve may, if qualified, be ordered to Active duty without his/her consent in time of war or national emergency declared by Congress, or when otherwise authorized by law. A member on inactive status or in a retired status may not be ordered to Active duty unless the secretary concerned, with the approval of the Secretary of Defense, determines that there are not enough qualified Reserves in an Active status or in the Inactive National Guard in the required category who are readily available.

#### B. READINESS

What is the current status of "readiness" for Reserve forces mobilization, and has it changed over the past fourteen years? As reported in the Military Forum, dated January/February 1988, an August 25, 1986, internal memo from the chief of the Reserve Officers' Training Corps was leaked to the press. It was reported that Major General Robert E. Wagner warned:

Our Reserve components are not combat ready, particularly National Guard combat units. Round-out is not working. These forces will not be prepared to go to war in synchronization with their affiliated Active-duty formations. The Army is deceiving itself to state otherwise...The Army needs some answers because our service is literally choking on our Reserve components.

The same issue of the Military Forum reported that according to the National Guard Bureau, both the Air and Army National Guard are struggling to reach an across-the-board readiness rating of C-3, far short of the C-1 rating of a unit fully trained and equipped to fight. Overall unit readiness is determined by two types of readiness: personnel and training. Retaining experienced personnel in the Reserves can help to satisfy the need for trained soldiers as well as fill out the ranks of the units, thus increasing readiness.

#### C. ARMY RESERVE COMPONENTS

When considering the Army Selected Reserve components, the US Army Reserve is the larger with a total strength of 616,725. The Army National Guard has a strength of 462,184. [Ref. 1] Though the Army Reserve and the Army National Guard are typical of Army forces, they have different roles. The Army Reserve is configured and tasked with providing supporting roles, while the Army National Guard is configured and tasked with augmenting the combat power of the Active component.

The Army National Guard is composed of infantry divisions and separate infantry brigades, armored divisions and separate armored brigades, armored cavalry regiments, special forces groups, engineer brigades and other battalion sized combat type units. The Army Reserve is composed of Army commands, training divisions, civil affairs, military



police, medical (hospitals), transportation and chemical units.

To understand the significance of the roles of the Reserve components and their impact on the total force, one only has to refer to the following distribution of typical missions that are assigned to Reserve components [Ref. 2]:

- 35 percent of combat divisions
- 55 percent of field artillery battalions
- 50 percent of special forces groups
- 81 percent of infantry battalions
- 45 percent of armor battalions
- 68 percent of combat engineer battalions/units
- 74 percent of army hospitals
- 66 percent of military police companies (non-division).

As is apparent, continued existence of the All-Volunteer Force depends fundamentally upon adequate numbers of personnel to man and maintain the force.

This research will identify factors influencing retention, provide a tool for evaluating policy changes and yield valuable insight for the management of retention and attrition in the Selected Reserves. These factors will be used to develop a multivariate model to assess the implications of policy changes, and thus aid in the management of attrition and retention.

Chapter II presents a review of empirical attrition studies related to United States Army Reserve components.

The theoretical framework of the thesis is also presented. Chapter III describes the method of data collection, sample sizes and survey demographic information. The development of multivariate models is also addressed to include selection of the dependent and explanatory variables. Multivariate models will be used to examine the relative importance of determinants of turnover. Chapter IV begins with a basic discussion of the primary research question. Data problems and limitations are discussed. This section presents bivariate analyses of attrition/retention with regard to potential explanatory variables taken from individual characteristics and selected cognitive/perceptual factors. Tables of multivariate results are also displayed in this section. Conclusions and recommendations are presented in Chapter V. Interpretation of the results relative to Reserve retention is provided in this chapter. Recommendations for areas of further study are presented.

Because of the importance of retention on Army readiness, its complexity and the many factors which affect it, the Army should have effective means for assessing the impact of policies, programs and practices on Reserve participation. The Army needs to know how its policies affect personnel motivation, adjustment to the military and ultimately retention.

## II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This review will focus on models of human behavior and economic theory to provide the basis for the development of a model which can be utilized to assess the implications of policy decisions. Part A discusses the causal factors that affect attrition and retention. Part B will present behavioral theory that has been associated with the decision to quit.

### A. CAUSAL RELATIONSHIPS

When the draft was in effect, retention and attrition of personnel in Selected Reserve units were less of a problem. During the Vietnam War, potential recruits and members of the Reserves were influenced by the pressures of the draft and the realization that, since the Reserve forces would not be activated en masse, service in the Reserves would mean avoidance of combat. The high levels of retention began to decline at the end of the war and the end of inductions.

The Gates Commission, executive and legislative leaders and military planners gave passing attention to the Reserve forces. Their emphasis was on providing incentives necessary to attract and retain volunteers for the Active forces so that induction could be ended. Little was done to help the Reserves survive in the volunteer environment.

The All-Volunteer Force was sustained by a series of major improvements in pay and other benefits for the Active forces, even in the face of large reductions in the required sizes of the various forces. Shortages in combat arms and other areas made it necessary to pay bonuses for enlistments. In general, pay and other benefits were also extended to the Reserve forces; however, enlistment bonuses were not authorized. Furthermore, the effect of pay raises was not really noticeable among Reserve personnel because Selected Reserve members receive pay only for a few days each month when training. To receive this income, members must commit themselves to an initial period of four months or more of Active duty for training, attendance at weekly or monthly drills and summer camps and a six-year eligibility for Active service in the event of an emergency.

The level of Reserve pay does not strongly affect retention decisions in the Army Selected Reserve Components. According to Grissmer et al., one explanation is that net, after-tax income actually derived from Reserve pay is much smaller than commonly perceived and thus less effective as an incentive to reenlist. Additional costs reduce net earnings: transportation to and from drills and lost income from civilian jobs during annual training. Grissmer et al., also found that for the typical reservist in their study, net annual after-tax Reserve income represented only 7 percent of total annual after-tax income. Increasing

Reserve pay by 50 percent would raise the discretionary income of a guardsman or reservist by only 3 or 4 percent. Analysis showed that a 50 percent increase in Reserve income would raise reenlistment rates only from 38 to 42 percent. [Ref. 3]

In 1977, Congress authorized \$5 million to evaluate the effect of a bonus on reenlistment in the Army National Guard and Army Selected Reserve. Bonuses of \$1800 were offered for a six year reenlistment and \$900 for a three year reenlistment, one half to be paid at reenlistment and the remainder to be paid in installments of \$150 at the completion of each year of obligated service. Reservists extending their commitments for fewer than three years were not eligible. The bonus program's objective was not only to increase retention, but also to lengthen the term of commitment.

Grissmer et al., in a study of the effects of the 1978 Bonus test found that the reenlistment rate increased from 38 to 40 percent. However, the deterrence of attrition led to an overall retention rate (after one and a half years) of 37 percent in bonus test areas, compared with 30 percent for control areas. The bonus incentives apparently encouraged members who had made long term commitments to honor those commitments. [Ref. 4]

The typical Reserve enlistee is 19-20 years of age at enlistment and 25-26 at the end of the first term. The

probability that the member will marry between enlistment and the end of the first term of enlistment has been estimated at between 54.1 and 71.4 percent [Ref. 5]. The birth of children is certain to be a factor in the participation decision. Conflicts with spouse and family life could influence reenlistment decisions.

Employer changes are frequent among younger personnel. Data show that annual turnover rates for full time civilian jobs are 36.6 percent for the 18-24 year old group [Ref. 6]. This implies that possibly 37 percent of the personnel in the 18-24 year old group will leave the military, and may reflect the fact that some employers have a negative attitude toward Reserve participation because of demands for time off.

Buddin (1984) demonstrated that age has a positive effect on early attrition in the Army Active forces. Age increases early attrition by about one percentage point per year for each year beyond age 17. He also found that race has a negative influence, and that blacks and Hispanics are less likely to separate during the first six months than white non-Hispanics. [Ref. 7]

Reservists receive many of the nonpecuniary benefits their Active counterparts receive: education, life insurance, tax and pension benefits, all which have been used to attract and retain highly qualified personnel. Reserve participation offers many rewards in the form of

training opportunities and the use of specialized equipment and weapons. Camaraderie among fellow reservists creates a favorable social environment not unlike other volunteer organizations (e.g., volunteer fire department). The decision to participate in the Reserves might be dominated by "taste" variables or patriotic needs.

Allen, in a study of correlates of Army career intentions in 1981, found that education was correlated in a negative direction. Similar findings have been reported by Buddin (1984). Allen cites two possible reasons for inverse correlation: competitive enticements offered by the civilian sector to those with more formal education, or the Army's failure to satisfy these enlisted personnel adequately. [Ref. 8]

Motowidlo and Lawton (1984) tested three alternative models of causal relationships between satisfaction, expectancy about consequences of staying, expectancy about consequences of quitting and intention to stay (reenlist) or quit for a sample of first term Army soldiers. The first model replicated Mobley, et al., (1979). The second model somewhat replicates the previous model, but with a slight change in that expectancy directly impacts satisfaction. Motowidlo and Lawton found that neither of the first two models were consistent with the correlation patterns observed between variables. The third model could not be completely ruled out due to the lack of a strong empirical

basis, and supported the conclusion that management strategies should be focused directly on job satisfaction. Consequently, turnover may be managed more effectively by improving supervisory practices, pay policies, job conditions and various other organizational practices to insure that the feeling of satisfaction remains. [Ref. 9] The final Motowidlo and Lawton Model is displayed in Figure 2.1.

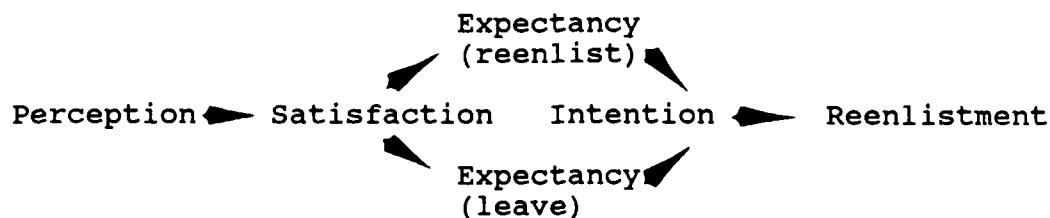


Figure 2.1 Motowidlo and Lawton Model (1984)

Cotton and Tuttle (1986) summarize some correlates of turnover from selected reviews of turnover and studies involving the turnover process for civilians. The correlates were classified as external factors, structural or work-related factors and personal characteristics of the employees. These variables are listed in Table 2.1. Table 2.1 is not meant to be all inclusive; however, it does show that correlates of turnover are numerous and most have been empirically verified in numerous publications. [Ref. 10]



TABLE 2.1

## CORRELATES OF TURNOVER

<u>External correlates</u>	<u>Personal correlates</u>
Employment perceptions	Age
Unemployment rate	Tenure
Accession rate	Gender
Union presence	Biographical information
	Education
<u>Work-related correlates</u>	Marital status
Pay	Number of dependents
Job performance	Aptitude and ability
Role clarity	Intelligence
Task repetitiveness	Behavioral intentions
Overall job satisfaction	Met expectations
Satisfaction with pay	
Satisfaction with supervision	
Satisfaction with co-workers	
Satisfaction with promotion opportunities	
Organizational commitment	

Source: Extracted from Cotton & Tuttle, "Employee Turnover: A Meta-Analysis and Review with Implications for Research," Academy of Management Review, Vol. 11, No. 1, 55-70, 1986.

## B. BEHAVIORAL THEORY

A previous study of Reserve attrition attempted to identify relationships between labor market theories (moonlighting and turnover behavior) and the decision to participate in the Reserve components [Ref. 11]. Findings were limited because of the data base and the model specifications utilized in the study. The data base was a cohort file for each fiscal year, 1978 through 1982, and was provided by the Defense Manpower Data Center. This research will also address the same labor market theories, using data

from the 1986 Survey of Reserve Components, and hopefully provide insight into the relationships between the decision to participate in the Reserves and those theories.

1. Moonlighting Labor Supply Theory

In 1973, Rostker and Shishko developed the theory of moonlighting which has also become known as secondary labor market participation. They developed this theory to explain the behavior of Air Force reservists. The theory basically portrays the decision to moonlight as a trade-off between leisure time and additional income. Rostker and Shishko identified and confirmed by empirical estimation both the importance and direction of effect of certain economic variables that were important to the decision to moonlight: primary job hourly wages, primary job hours and secondary job hourly wages. Those personnel having primary jobs with higher hourly wages and longer hours were less likely to moonlight. A 10 percent decrease in primary working hours or wages would increase the probability of moonlighting by 10 percent. The most important finding in this study was that a 10 percent increase in secondary wages would yield a 9 percent increase in the probability of moonlighting. [Ref. 12]

2. Turnover Behavior

Over the past 25 years, several articles on turnover have appeared. Most of these reviews have identified job attitudes (e.g., job satisfaction, commitment) and

demographic variables (e.g., age, marital status, tenure) as important predictors of job turnover. Other reviews have also noted the importance of alternative job possibilities and the importance of behavioral intentions (e.g., to look for a job, to intend to change positions) as key determinants of actual turnover.

Several theories have been developed which propose to explain why people are satisfied with their jobs. According to McCormick and Ilgen (1980), "the most widely accepted view of job satisfaction assumes that the degree of effect experienced by a person results from some comparison between the individual's standard and that individual's perception of the extent to which the standard is met." [Ref. 13] The degree of satisfaction is the difference between what is experienced and the standard. The standard is sometimes defined as "human needs" or "human values." Human needs are physical (bodily functioning) and psychological (mentally functioning). Human values are what a person desires to attain over time. Values determine the choices people make and the emotional responses to those choices. Locke (1969) and Mobley and Locke (1970) supported this view in their research [Refs. 14,15].

The need hierarchy theory, developed by Maslow (1970) identifies a relationship between human needs and the behaviors that influence them. According to Maslow, these needs are ranked in a hierarchy. The needs are ranked from

lowest to highest as follows: physiological, safety, social, self-esteem and self-actualization [Ref. 16]. The military certainly does a good job in satisfying the lower ones as well as some of the upper level ones. What is most applicable to this analysis is how well the military satisfies the upper level needs--social, self-esteem and self-actualization. Satisfaction of these needs gives the individual a sense of adequacy, but by not obtaining these needs, the individual feels a sense of loss or helplessness.

Herzberg, Mausner and Snyderman (1959) describe job satisfaction in terms of (1) satisfiers--content factors that result in satisfaction, and (2) dissatisfiers--context factors that result in satisfaction as related to the job. When a job provides a lot of content factors such as recognition of achievement, the employee will feel satisfied; however, in the absence of such factors, the employee will not feel dissatisfied, but will feel indifferent. Alternatively, when a job provides plenty of context factors such as high salaries or good working conditions, the employee will not feel satisfied, but will feel indifferent. When these factors are absent from the job, the employee will become dissatisfied. According to Herzberg, there should be a high degree of both content and context factors present to avoid dissatisfaction and to ensure satisfaction [Ref. 17].

Additionally, it is important to consider an individual's expectations of military life. Expectancy is the perceived relationship between effort and outcome. The expectancy theory originated in 1930, but was most recently applied by Porter and Lawler (1968) [Ref. 18]. They provided a basis for understanding the relationship between how an individual perceives a situation and what happens when those expectations are confirmed or violated. The extent to which an individual's expectations of the military are met can determine the level of satisfaction received from a particular job.

Much research has dealt with job satisfaction and its relationship with personal variables, employment conditions and job behavior. Research has shown that the variation in job satisfaction caused by personal variables is very small, and estimates by Landy and Trumbo (1980) range between two and five percent [Ref. 19]. Lawler (1971) determined that dissatisfaction with pay may promote poor performance, turnover and overall dissatisfaction with the job [Ref. 20]. The relationship between job satisfaction and job behavior are substantial; the correlation between turnover and job satisfaction is on the average about .40 according to Muchinsky and Tuttle [Ref. 21].

Perhaps the most comprehensive efforts at modeling the turnover process have been conducted by Mobley and his colleagues. Mobley (1977) indicated variables that connect

job attitudes with actual turnover behavior in his model of the intermediate linkages in the turnover process. His turnover model consisted of the following factors:

- Evaluation of existing job
- Experience job satisfaction/dissatisfaction
- Think about quitting
- Evaluate expected utility of search and cost of quitting
- Intentions to search for alternate employment
- Search for alternate employment
- Evaluate alternatives
- Comparison of alternatives and present job
- Intention to stay/leave
- Quit/stay.

One of the major contributions of his work was to suggest that job attitudes are most directly related to withdrawal conditions associated with the decision to leave and only indirectly related to actual turnover behavior. [Ref. 22]

Mobley's second model (1978) was a more comprehensive effort to attempt to identify the broad range of factors that can initiate the desire to leave the organization. This model, as displayed in Figure 2.2, was less concerned with intermediate linkages in the decision process than with complex relationships between job-related and non-job factors that can influence the initiation of the decision process. [Ref. 23]

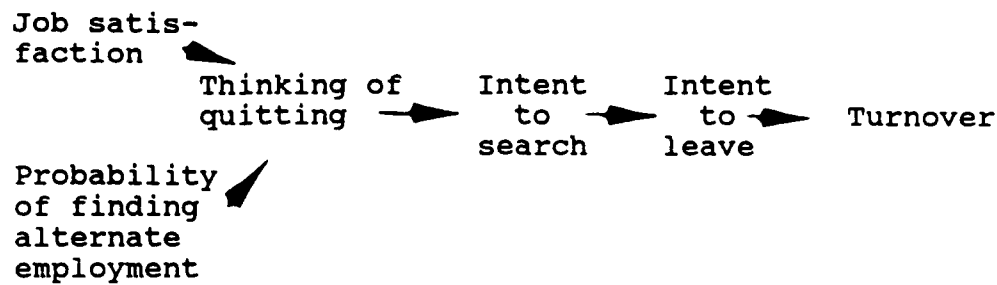


Figure 2.2 Mobley, et al., Model (1978)

Much empirical support for the model proposed by Mobley (1978) is available. Miller and colleagues (1979) tested the Mobley model by classifying variables into one of four groups: (1) withdrawal behavior; (2) withdrawal conditions (e.g., think about quitting, intention to search, intention to quit); (3) career mobility (e.g., probability of finding an alternative) and (4) job attitudes. Withdrawal conditions explained the greater proportion of variance in turnover among two samples of National Guard personnel. Little additional variance was explained by adding either job satisfaction or career mobility to the prediction of turnover by withdrawal cognition. Miller expressed strong support for the model based on double cross-validation of the results across the two homogeneous samples. [Ref. 24] The Miller, et al., model is displayed in Figure 2.3.



Figure 2.3 Miller, et al., Model (1979)

Michaels and Spector tested a simplified version of Mobley's (1979) comprehensive turnover model. They found that the most direct predictor of turnover was the intention to quit. Moreover, the influence of job satisfaction and organizational commitment on turnover was indirect through the relationship of these variables to behavioral intentions. [Ref. 25]

Dalessio, Silverman and Schuck (1986) tested the Mobley (1979) model using path analysis, and found problems of multicollinearity in the model design. One consequence of multicollinearity may be highly unreliable path coefficients leading to specification errors in a path model. Dalessio, et al., could not empirically support the entire Mobley, et al., (1979) model. However, support was found for the indirect effect of age on turnover through job satisfaction, the indirect effect of job satisfaction on turnover through withdrawal cognition and intent to quit as the immediate precursor to actual turnover. Further support was found for the direct effect of withdrawal cognition on intent to search, though there was no empirically supportable linkage of intent to search with turnover. The Dalessio, et al., (1986) model is displayed in Figure 2.4. [Ref. 26]

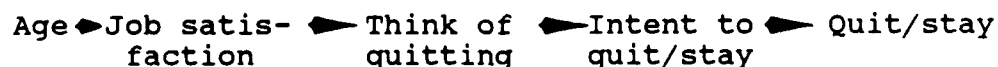


Figure 2.4 Dalessio, et al., Model (1986)



Mobley, Griffeth, Hand and Meglino (1979) conducted a follow-up study emphasizing the individual decision process. They included organizational, economic, personal and occupational variables as antecedents of perception, values and alternatives of the individual. [Ref. 27] The Mobley, et al., (1979) model is displayed in Figure 2.5.

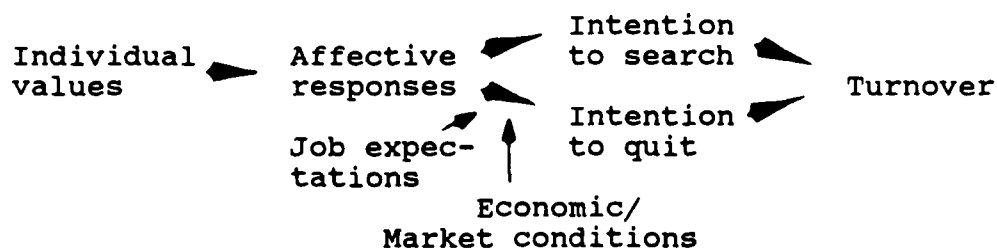


Figure 2.5 Mobley, et al., Model (1979)

Bluedorn (1979) developed a model that includes individual (attitudinal and demographic), organizational and environmental variables. This model is important because it has incorporated the intention to leave as an intervening linkage connecting job satisfaction and turnover behavior. It also focuses on contextual rather than psychological antecedents of the separation process. [Ref. 28] The Bluedorn model is displayed in Figure 2.6.

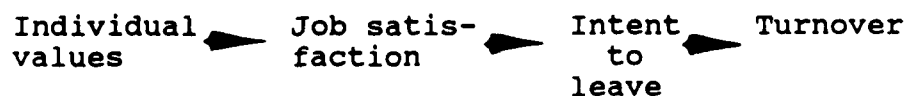


Figure 2.6 Bluedorn Model (1979)

A cognitive model of the turnover process advanced by Steers and Mowday (1981) and elaborated in Mowday, Porter and Steers (1982) depicts the desire/intent to stay or leave as mediating the relationship between affective mechanisms and their behavioral outgrowths [Refs. 29,30]. The Steers and Mowday model is displayed in Figure 2.7.

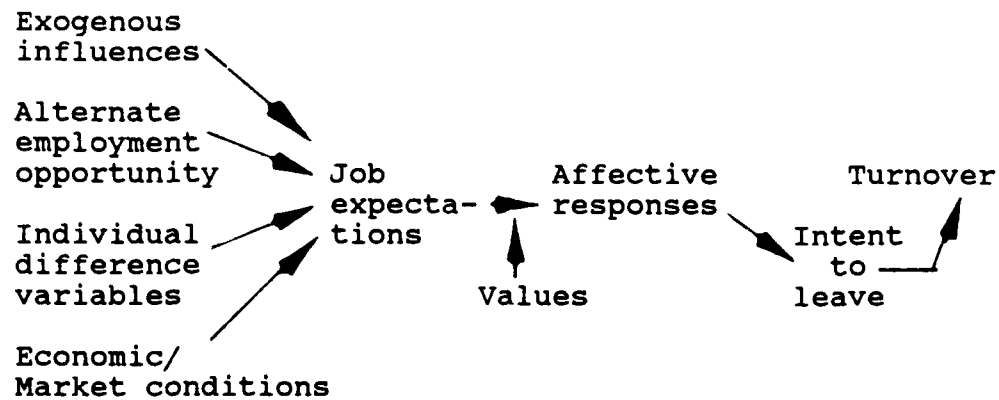


Figure 2.7 Steers and Mowday Model (1981)

Arnold and Feldman conducted a multivariate analysis of the turnover process using the following variables: demographic, tenure, cognitive/affective orientation to current position (including multiple measures of job satisfaction and organizational commitment), perceived job security, intention to search for an alternative position, perceived existence of alternative positions and intention to change positions. Turnover behavior was found to be more strongly related to intentions to search for alternatives

than intentions to change positions. [Ref. 31] The Arnold and Feldman model is displayed in Figure 2.8.

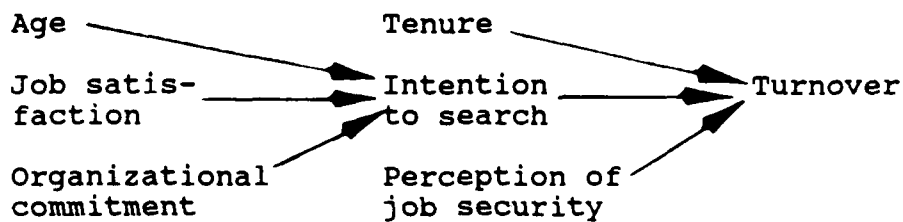


Figure 2.8 Arnold and Feldman Model (1982)

### C. SUMMARY

To summarize, recent research has postulated and attempted to empirically support turnover processes, developing models derived from hypothesized linkages between factors of job satisfaction, organizational commitment, withdrawal cognition and their correlates. Since aggregate data sources have been few, little research has been dedicated to identifying factors or models that explain the decision process relative to turnover. Factors of intent (e.g., search, quit, stay, etc.) are generally accepted as precursors to actual turnover. The theoretical framework of this thesis is based on the determinants of turnover empirically supported in the studies discussed above. Numerous individual, societal, organizational and job attitude factors play a part in the decision to separate or remain in the Reserve forces. Identification of those

factors will serve to target our policy efforts towards retaining the best possible Reserve personnel.

### III. DESCRIPTION OF DATA AND METHODOLOGY

#### A. RESEARCH OBJECTIVES

The main objective of this research effort is to identify the relative importance of factors which influence an individual's decision to separate or remain in the Selected Reserves. These factors will be used to develop a model which can be used to assess the implications of policy changes, and manage attrition and retention in the Reserves. Subsidiary research objectives are to identify population characteristics of National Guard and Army Reserves by prior and non-prior active service. Differences in and the importance of human behavior and economic factors for both groups will be discussed.

Because Selected Reserve units are the first to augment the Active forces in the event of mobilization, this study will be limited to those enlisted members who comprise such units. Furthermore, since those individuals in the training pipeline are excluded from immediate augmentation, they will not be included in this study.

This section will describe the survey used to collect the data; discuss some potential problems with the data set; identify the primary dependent variable; profile the influences on prior and non-prior service groups for Army Selected Reserve enlisted; present sample sizes and

demographics and introduce the research hypotheses and methodology.

B. THE 1986 RESERVE COMPONENTS SURVEY

1. History of the Survey

The data to be used in this study will come from the 1986 Reserve Components Survey of Enlisted Personnel. In 1983, the Deputy Secretary of Defense mandated a survey of military families, who were beginning to be recognized as important to the retention and readiness of the armed forces. Concurrent needs of the Department of Defense were to assess the impact of a wide range of personnel policies. The two requirements were merged into one.

In 1985, the Deputy Assistant Secretary of Defense (Guard/Reserve Manpower and Personnel) asked the Defense Manpower Data Center to conduct the 1986 Reserve Components Surveys. The surveys had multiple objectives permitting the study of patterns of previous Active and Reserve component service; financial issues that would face Guard and Reserve families in the event of mobilization; the interaction between the amount and forms of Reserve compensation and career intentions; the relationship between civilian occupations and military occupations for members; availability of medical and health coverage to Reserve families from non-Reserve sources; the impact of employer policies, practices and attitudes on member Reserve

participation and the role of the family in Reserve participation [Ref. 32].

The 1986 Reserve Components Surveys consist of three separate survey instruments, two of Reserve component members and the third of their spouses. The 1986 Reserve Components Survey: Selected Reserve Officer and Enlisted Personnel sampled Select Reserve unit personnel (Individual Mobilization Augmentees, Selected Reservists and military technicians). The 1986 Reserve Components Survey: Full-Time Support Officer and Enlisted Personnel surveyed Active Guard/Reserve or Training and Administration of Reserve personnel. All seven Reserve Components (Army National Guard, Army Reserve, Naval Reserve, Marine Corps Reserve, Air National Guard, Air Force Reserve and Coast Guard Reserve) were included in the 1986 Reserve Components Surveys. The 1986 Reserve Components Survey of Spouses of Selected Reserve Personnel surveyed the spouses of all individuals sampled for participation in the above two surveys.

The survey instrument was a questionnaire designed to collect reliable information by major section:

- Military Background
- Military Plans
- Military Training, Benefits and Programs
- Individual and Family Characteristics
- Civilian Work

- Family Resources
- Military Life.

The data were edited for consistency, skip patterns and out-of-range values by the Defense Manpower Data Center.

## 2. Survey Populations and Samples

The Reserve Components Common Personnel Data System as of 30 October 1985 was used to initially define the survey population. The Reserve Components Common Personnel Data System also contains administrative data on Guard/Reserve members which was used in data collection.

The population for the basic military samples of the survey consisted of Selected Reserve trained officer and enlisted personnel (individuals in the training pipeline were excluded). The member population was stratified by Reserve component, Reserve category, officer or enlisted status and sex.

Final sample sizes were selected as a compromise between the number of questionnaires needed for statistical validity and budgetary constraints. Most strata provided for a 10 percent sample. Within each strata, military members were selected with equal selection probability. The final sample sizes, by stratum, are shown in Table 3.1.

In addition, approximately 13,000 Army National Guard (ARNG) and Army Reserve (USAR) members of specific units from a previous survey in 1979 were followed-up in the 1986 survey. These units were included so that changes in



TABLE 3.1

BASIC SAMPLE OF MILITARY MEMBERS SELECTED FOR THE 1986  
RESERVE COMPONENTS SURVEYS

Respondent Type	Reserve Component		Total Selected Reserve
	ARNG	USAR	
<u>Unit Members</u>			
Officer			
Male	3,175	3,345	6,520
Female	385	1,340	1,725
Enlisted			
Male	30,785	15,826	46,611
Female	1,408	3,164	4,572
<u>Non-Unit Members</u>			
Officer			
Male	-	795	795
Female	-	94	94
Enlisted			
Male	-	291	291
Female	-	42	42
<u>Technicians</u>			
Officer			
Male	531	96	627
Female	31	13	44
Enlisted			
Male	1,548	243	1,791
Female	141	29	170
<u>Full-Time Support</u>			
Officer			
Male	277	280	557
Female	22	43	65
Enlisted			
Male	1,523	592	2,115
Female	188	191	379
Total	40,014	26,384	66,398

Source: Basic data provided by the Defense Manpower  
Data Center.

personnel attitudes and attributes could be compared between 1979 and 1986. Members selected for the 1979 follow-up are included in the 1986 survey population. These units had been randomly selected and surveyed in the 1979 Reserve Force Studies Survey and were still in existence at the time of the 1986 survey.

The follow-up sample consists of 12,977 members; 7,443 individuals in the Army National Guard and 5,534 in the Army Reserves. Since some individuals are in both the follow-up sample and the basic sample, there is an overlap of 1,257 members; 736 in the Army National Guard and 521 in the Army Reserves.

### 3. Survey Administration

Packages containing questionnaires and related materials were mailed directly to approximately 15,000 units. The unit commander or some other point of contact was responsible for the actual administration of the questionnaire. Monitoring of the administration was conducted by a contract organization, National Computer Systems, to include follow-up on questionnaires not received. Occasional assistance was required of Defense Manpower Data Center personnel and the Office of the Deputy Assistant Secretary of Defense (Guard/Reserve Manpower & Personnel) when specific problems occurred.

#### 4. Response Rates

As shown in Table 3.1, the basic sample consisted of a total of 66,398 officer and enlisted members. When the individuals from the follow-up group of 1979 were included (excluding those selected for both samples), the total to be surveyed became 78,118. Table 3.2 compares the number of questionnaires mailed out with the final numbers by stratum.

TABLE 3.2

1986 RESERVE COMPONENTS SURVEYS RESPONSE RATES FOR  
MILITARY MEMBERS, BY RESERVE COMPONENTS

Reserve Component	Selected	Responding	Response Rate*
<u>USAR</u>			
Officer	6,006	3,608	60.1
Enlisted	25,391	9,640	38.0
<u>ARNG</u>			
Officer	4,421	2,810	63.6
Enlisted	42,300	21,034	49.7
<u>Selected Reserves Response</u>			
Officer	10,427	6,418	61.6
Enlisted	67,691	30,674	45.3
Total	78,118	37,092	47.5

\* Response rates are unadjusted.

Source: Basic data provided by the Defense Manpower Data Center.

Officer response rates were higher than those for enlisted personnel, with the overall officer total (unadjusted) being 62 percent and the enlisted personnel (unadjusted) being 45 percent. The unadjusted response rate for all components, officer and enlisted personnel combined, is 48 percent.

#### C. HYPOTHESIZED TURNOVER PROCESS MODEL

A conceptual model of the turnover process for Selected Reserve affiliation used initially in this thesis is shown in Figure 3.1. This model is derived from the turnover process literature and will be used to explain the affiliation intentions of first-term enlisted Selected Reservists. Candidate explanatory variables used to predict Reserve participation intentions were grouped into the following categories:

- Demographic--Respondent's biographical information allowing the development of homogeneous groups for analysis.
- Military Experience--Variables which provide information about the respondent's military experience.
- Cognitive/Perceptual--Variables designed to assess the individual's perception of, and attachment to, their Reserve job and the Reserves.
- Spouse's Attitude--Respondent's assessment of their spouse's attitude toward certain facets of the members participation in the Reserves.
- Employer's Attitude--Respondent's assessment of their employer's attitude toward certain facets of the members participation in the Reserves.

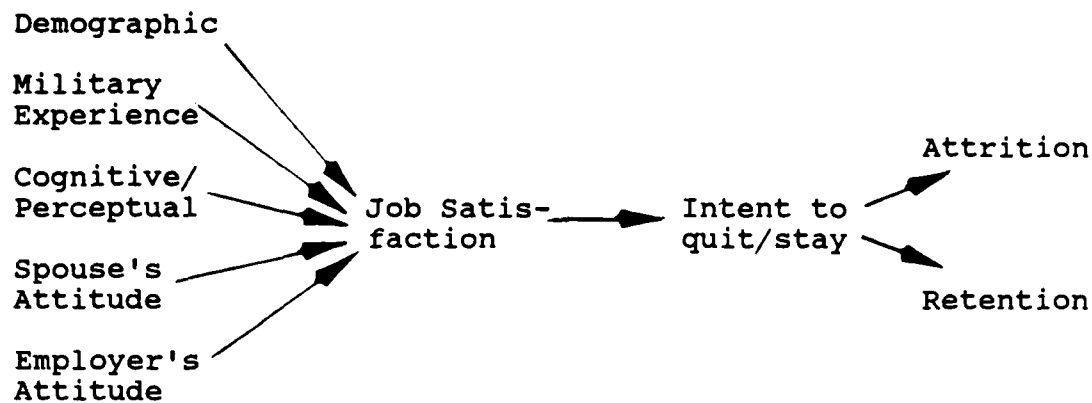


Figure 3.1 Hypothesized Turnover Process Model

#### D. VARIABLE SELECTION

##### 1. Identification of the Dependent Variable

With today's economic times and the all-recruited force, it is desirable to determine what behavior can be influenced to produce satisfied soldiers and retain them in the Reserve forces. The underlying theory is that policy adjustments to certain behavioral factors of an individual's "makeup" can impact on that individual's job satisfaction and subsequent reenlistment or attrition intentions.

There are numerous ways to measure the attributes of job satisfaction. Most common are facet-free measures of job satisfaction quite often criticized as one dimensional, when job satisfaction seems very likely to be multidimensional. A more general means of measuring job satisfaction is through the use of facet-specific measures. Faceted measures ask the respondent to assess satisfaction with a series of specific job facets. This is much more

advantageous since it coincides with the multidimensional character measures of job satisfaction, and provides comparability across individuals. The 1986 Reserve Components Survey used the facet-specific measurement in relation to satisfaction with several different attributes.

The survey asks the question, "How likely are you to REENLIST OR EXTEND at the end of your current term of service?" Available responses were categorized as "No chance (0 in 10) ranging to certain (10 in 10)." This question will become the dependent variable and form the behavior of interest for the multivariate retention model to be estimated. Frequencies for responses to the question are shown in Table 3.3.

TABLE 3.3  
1986 RESERVE COMPONENTS SURVEY, FREQUENCIES FOR RESPONSES TO THE QUESTION, "HOW LIKELY ARE YOU TO REENLIST OR EXTEND AT THE END OF YOUR CURRENT TERM OF SERVICE?"

Response	Frequency	Percent
(0 in 10) No chance	2,619	9.1
(1 in 10) Very slight possibility	1,791	6.2
(2 in 10) Slight possibility	1,242	4.3
(3 in 10) Some possibility	2,020	7.0
(4 in 10) Fair possibility	1,427	5.0
(5 in 10) Fairly good possibility	1,985	6.9
(6 in 10) Good possibility	2,681	9.3
(7 in 10) Probable	1,918	6.7
(8 in 10) Very probable	1,873	6.5
(9 in 10) Almost sure	3,268	11.4
(10 in 10) Certain	7,897	27.5
Total	28,721	100.0

Source: 1986 Reserve Components Survey.

As can be seen in Table 3.3, 27.5 percent of the personnel responding to the survey indicate that they are certain to reenlist or extend at the end of their current term of service, while 9.1 percent indicate no chance of reenlistment or extension. The rest of the respondents are scattered among the various choices ranging from very slight possibility to almost sure. To gain insight on differences between stayers and leavers, the question will be dichotomized (1 to 3 = 0, 8 to 11 = 1) relative to the intent to leave (0) or stay in (1) the Selected Reserves.

## 2. Identification of Candidate Explanatory Variables

Data were selected for analysis based on the literature review described in the previous chapter. Factors have been identified by major categories for analysis of their influence relevant to the attrition or retention decision. The major categories are: demographic, military experience, cognitive/perceptual, spouse's and primary civilian employer's attitude toward the member's participation in the Guard/Reserves.

Candidate demographic variables for analysis include race, gender, age, marital status, education and number of dependents. Table 3.4 presents a frequency distribution of these attributes by prior and non-prior service member.

As shown in Table 3.4, there are some apparent differences between non-prior and prior service groups. Both groups are predominantly Caucasian (76.7 percent of the

TABLE 3.4

1986 RESERVE COMPONENTS SURVEY, DEMOGRAPHIC CHARACTERISTICS,  
BY NON-PRIOR AND PRIOR ACTIVE SERVICE

Characteristic	Non-prior Service		Prior Service	
	Frequency	Percent	Frequency	Percent
<u>Race</u>				
White	11,390	76.7	9,801	72.3
Black	2,499	16.8	2,870	21.2
Other	970	6.5	893	6.5
<u>Gender</u>				
Male	13,303	89.5	12,811	94.4
Female	1,556	10.5	753	5.6
<u>Age</u>				
16--19 years	826	5.6	28	0.2
20--24 years	5,697	38.3	1,057	7.8
25 or more years	8,336	56.1	12,479	92.0
<u>Marital Status</u>				
Single	7,191	48.4	3,860	28.5
Married	7,668	51.6	9,704	71.5
<u>Education</u>				
Non-High School	1,887	12.9	1,230	9.2
GED/equivalent	1,761	12.0	2,120	15.9
High School/more	11,024	75.1	10,021	74.9
<u>Number of Dependents</u>				
None	7,249	48.8	3,836	28.3
One	2,767	18.6	2,640	19.5
Two or more	4,840	32.6	7,084	52.2
n (totals may vary due to missing cases on some variables)	14,859		13,564	

Source: Derived from data extracted from the 1986 Reserve Components Surveys.



non-prior service group and 72.3 percent of the prior service group). The non-prior service group is 16.8 percent black and 6.5 percent other (American Indian/Alaskan, Oriental, and other small groups).

The prior service group is 21.2 percent black and 6.6 percent other. As might be expected, there are more males than females. Of the non-prior service group, 89.5 percent are males, and 10.5 percent are females. Of the prior service group, 94.4 percent are males, and 5.6 percent are females.

Age differences are more striking as can be seen in the differences in the percentages between the two service groups. The non-prior service group comprises 84.4 percent versus 15.6 percent of the prior service group in the age bracket, 20 to 24. The age bracket 16 to 19 also shows similar differences, 96.7 percent for non-prior service personnel and 3.3 percent for prior service.

Less separation occurs between prior and non-prior service groups in the oldest age bracket, 25 years of age and older, 60 percent in the prior service group and 40 percent in the non-prior service group. This indicates that nine tenths of prior service members are at least 25 years of age, and that close to one third of non-prior service members are 20 to 24 years of age; and two thirds are 25 years of age or older. The tendency for the prior service group to be more senior than the non-prior service may be

accounted for the fact that most members separating from active duty will have completed at least one term of service.

About 71.5 percent of the prior service members are married, and 28.5 percent are single as compared to the non-prior service members of which 51.6 percent are married and 48.4 percent are single. Both groups seem to have similar educational background, non-prior service members are 75.1 percent high school graduates, 12.0 percent GED or equivalent, and 12.9 percent are non-high school graduates. Prior service members are 74.9 percent high school graduates, 15.9 percent GED or equivalent and 9.2 percent non-high school graduates.

The numbers of dependents for prior service members are 52.2 percent (2 or more dependents), 19.5 percent (1 dependent) and 28.3 percent (no dependents). While, non-prior service members have 32.6 percent (2 or more dependents), 18.6 percent (1 dependent) and 48.8 percent (no dependents). Dependents were defined as some person, other than a spouse, who were 100 percent dependent on the service member for support.

Candidate military experience variables chosen for analysis are Reserve component, pay grade and term of enlistment. Table 3.5 shows the relative frequencies by characteristic and whether or not the member had prior or non-prior active service. The non-prior service group was

TABLE 3.5

1986 RESERVE COMPONENT SURVEY, MILITARY EXPERIENCE  
CHARACTERISTICS, BY NON-PRIOR AND PRIOR ACTIVE SERVICE

Characteristic	Non-prior Service		Prior Service	
	Frequency	Percent	Frequency	Percent
<u>Reserve Component</u>				
ARNG	10,976	73.9	8,296	61.2
USAR	3,883	26.1	5,268	38.8
<u>Pay grade</u>				
E1-E3	2,805	18.9	424	3.1
E4	5,295	35.6	3,212	23.7
E5	3,167	21.3	4,486	33.1
E6	2,002	13.5	3,403	25.1
E7-9	1,590	10.7	2,039	15.0
<u>Term of Enlistment</u>				
1 year or less	654	4.5	1,403	10.4
2 years	204	1.4	398	3.0
3 years	2,399	16.3	4,459	33.2
4 years	261	1.8	410	3.1
5 years	102	0.7	86	0.6
6 years or more	11,066	75.3	6,667	49.7
n (totals may vary due to missing cases on some variables)	14,859		13,564	

Source: Data derived from the 1986 Reserve Components Surveys.

73.9 percent ARNG and 26.1 percent USAR. The prior service group was 61.2 percent ARNG vice 38.8 percent USAR.

Pay grade percentages for non-prior service members were 18.9 percent E1 to E3, 35.6 percent E4, 21.3 percent E5, 13.5 percent E6 and 10.7 percent E7 to E9. Prior

service pay grades and percentages were 3.1 percent E1 to E3, 23.7 percent E4, 33.1 percent E5, 25.1 percent E6 and 15.0 percent E7 to E9. Terms of enlistment appear clustered around 3 year and 6 year terms, as one might expect, 16.3 percent (3 year) and 75.4 percent (6 year) for non-prior service members vice 33.7 percent (3 year) and 49.7 percent (6 year) for prior service members.

The 1986 Reserve Survey included a series of questions asking the member to evaluate (on a cognitive/perceptual basis) how important any given question was to each of the following: the decision to participate in the Guard/Reserve, meeting the unit's training objectives and the level of satisfaction or dissatisfaction with features of the Guard/Reserves. Generally, responses to these types of questions have been proven in previous research to be related to the behavior associated with turnover (the importance of benefits such as pay, allowances, retirement, commissary and exchange privileges and education) and will be examined in this study for contribution to the decision to separate or remain in the Reserves.

Table 3.6 lists the candidate cognitive/perceptual variables and their value coding. Spouse attitude and primary civilian employer attitude about the member's participation, as expressed in the member's opinion, will

TABLE 3.6

1986 RESERVE COMPONENTS SURVEY, DESCRIPTION OF  
CANDIDATE COGNITIVE/PERCEPTUAL VARIABLES

Variable	Question	Value Label
<u>Reasons/contribution to recent decision to stay in Guard/Reserve</u>		
Serving the country; using educational benefits; obtaining training vice civilian job; credit toward retirement; promotion opportunity; use military equipment; challenge of military training; need money for family expense; wanted extra money to use now; save income for the future; travel/get away; enjoy Guard/Reserve; pride in accomplishments	Q26A-Q26N	continuous 1 = major contribution 4 = minor contribution
<u>Opinions/problems in meeting unit training objectives</u>		
Out-of-date equipment/weapons; poor mechanical condition of equipment/weapons; below strength E1 to E4; below strength E5 to E9; not enough staff resources; low attendance at unit drills; low attendance at Annual Training; ineffective Annual Training; shortage of MOS qualified personnel; low quality personnel in low grade unit drill positions; not enough drill time to practice skills; not enough drill time to plan training objectives and get paperwork done; lack of access to good training facilities and grounds; lack of good instruction manuals	Q43A-Q43O	continuous 1 = a serious problem 7 = not a problem

TABLE 3.6 (CONTINUED)

& materials; lack of supplies

Opinion of unit drills

Satisfaction with: training; opportunity to use MOS skills; opportunity for pro- motion; opportunity for leadership	Q46-Q49	continuous 1 = very dissatisfied 7 = very satisfied
Description of weapons/ equipment at drills;	Q50	continuous 1 = out-of-date 7 = up-to-date
Mechanical condition of weapons/equipment used at drills	Q51	continuous 1 = poor 7 = excellent
Satisfaction with unit's activities at 1985 Annual Training	Q52B	continuous 1 = very dissatisfied 7 = very satisfied
Morale of military personnel in unit	Q53	continuous 1 = morale very low 7 = morale very high
Satisfaction with supervision/direction at unit drills	Q54	continuous 1 = very dissatisfied 7 = very satisfied

Level satisfaction/dissatisfaction with features of Guard/Reserve

Military pay & allowances; commissary privileges; other military privileges; time required at Guard/ Reserve activities; retirement benefits; unit social activities; opportunity for education/ training; opportunity to serve one's country; acquaintances/friendships	Q123A-Q123I	continuous 1 = very satisfied 5 = very dissatisfied
---	-------------	---

Source: Extracted from the 1986 Reserve Components Surveys.

also be investigated. Table 3.7 lists the candidate spouse and primary civilian employer attitude variables.

#### E. RESEARCH HYPOTHESES AND METHODOLOGY

An examination of what led Reserve members to decide to separate or remain in the Reserve components will be conducted to determine how non-prior and prior service members differ. Variables have been selected based on the literature review of previous research.

Data reduction techniques such as factor analysis will be used to observe relationships in the variables selected for analysis. If a common factor, shared by all variables, can be found then the variables can be categorized into a smaller number of variables.

Multivariate models will be developed to identify the relative importance and the interrelationships of all candidate explanatory variables listed in Tables 3.4 through 3.7 as possible determinants of retention behavior. Demographic factors race, gender, age, marital status, education and number of dependents will be used in the analyses. Military experience factors such as Reserve component, pay grade and term of enlistment will also be used in the analyses. Other factors such as cognitive/perceptual, spouse and primary civilian employer attitudes will also be analyzed. Chapter IV will present the results of the analysis of the 1986 Reserve Components Survey.

TABLE 3.7

1986 RESERVE COMPONENTS SURVEY, DESCRIPTION OF CANDIDATE  
SPOUSE AND PRIMARY EMPLOYE ATTITUDES TOWARD  
GUARD/RESERVE PARTICIPATION

Variable	Question	Value Label
<u>Opinion of spouse's attitude</u>		
Agreement with civilian career plans	Q85	continuous 1 = very well 7 = not well at all
Agreement with military career plans	Q86	continuous 1 = very well 7 = not well at all
How much of a problem is the following: absence for weekend drill; absence for Annual Training, absence for extra time at Guard/Reserve	Q87A-Q87C	continuous 1 = serious problem 4 = not a problem
Overall attitude toward Guard/Reserve participation	Q88	continuous 1 = very favorable 5 = very unfavorable
<u>Opinion of primary civilian employer's attitude</u>		
Overall attitude toward Guard/Reserve participation	Q94	continuous 1 = no civilian job 2 = self employed 3 = very favorable 7 = very unfavorable
How much of a problem is the following: absence for weekend drill; absence for Annual Training; absence for extra time at Guard/Reserve; time spent at work on Guard/Reserve business	Q95A-Q95D	continuous 1 = serious problem 4 = not a problem 5 = does not apply 6 = do not know

Source: Extracted from the 1986 Reserve Components Surveys.



#### IV. DATA ANALYSIS

This section describes the analyses undertaken to identify factors which influence the Reserve participation decision. The primary research objective is to develop a model to be used in predicting retention of Guard/Reserve personnel.

##### A. DATA LIMITATIONS

A major deficiency of the 1986 Reserve Components Survey is the absence of information such as military occupational specialty, unit identification code, or geographical region, all of which may have important effects on retention. As is evident later in the study, behavioral differences exist between National Guard and Army Reserve members relative to retention and attrition. Some of these differences could have been related to the fact that the National Guard, for the most part, are combat forces and the Army Reserve consists of combat support and combat service support.

Another major deficiency of the 1986 Reserve Component Survey is that income related variables, such as annual civilian income and military income, were collected by the survey, but could not be validated and were eliminated from the data set provided by the Defense Manpower Data Center. Consequently, the relationship between civilian employment

and Reserve participation could not be evaluated, and the moonlighting model could not be tested.

#### B. DATA RESTRICTIONS

Sample sizes were reduced in order to obtain relatively homogeneous subgroups for analysis. For example, attrition/retention of those members older than 35 years of age and higher in rank than E4 is not really an area of interest. The higher levels of attrition, and thus areas for retention management, appear to be in the younger age groups and primarily E4 and below. Consequently, this analysis will consider only young males (16 to 35 years old) in the pay grade E1 to E4.

The majority of the cases are single, thus spouse-related questions would restrict the number of cases for analysis to married members, and that is not the purpose of this study. By considering the effects of civilian employer attitudes, the sample size is further restricted to those individuals employed. Those members who were not married or unemployed did not have responses for these variables. Therefore, sample sizes would be further restricted by the variables concerning spouse and civilian employer.

The factor representing responses to the spouse attitude questions contained 522 cases in the non-prior active service group. The factor representing responses to the civilian employer attitude questions contained 1093 cases in the non-prior active service group. The prior active

service group is the smaller of the two groups in this study, and would become too small to permit analysis. To maintain a valid sample size, this analysis will not consider the candidate explanatory variables, spouse and civilian employer attitudes. These influences, relative to the participation decision, will be recommended as an area for further study.

### C. BIVARIATE ANALYSIS

Two-way cross tabulations were used to produce bivariate tables of the candidate dependent and explanatory variables. This permits identification of sub-populations and the evaluation of homogeneous groups. Differences in the patterns of attrition and retention were evident between males and females indicating the likely necessity for estimating separate models for males and females. Due to time limitations, the scope of this analysis was limited to the males who comprise over 85 percent of the Selected Reserves.

#### 1. Bivariate Analysis of Non-prior Active Service Group

Table 4.1 displays the bivariate cross tabulation of the dependent variable "intent to reenlist or extend," by selected explanatory variables, by Reserve component for the non-prior active service group. Non-prior active service members of the Guard show a tendency to have a higher rate of attrition than their counterparts in the Army Reserve.

TABLE 4.1

CROSS TABULATION OF INTENT TO REENLIST OR EXTEND  
 BY SELECTED EXPLANATORY VARIABLES, BY RESERVE  
 COMPONENT FOR THE NON-PRIOR ACTIVE SERVICE GROUP

Explanatory Variable	<u>Intent</u>			
	ARNG		USAR	
	Freq.	Pct. Stayers	Freq.	Pct. Stayers
<u>Pay Grade</u>				
E1 to E2	84	45.2	31	48.4
E3	337	53.1	99	53.5
E4	621	54.4	240	62.5
<u>Entry Age</u>				
16 to 19 years	695	50.6 **	236	59.7
20 to 24 years	265	56.6 **	100	57.0
25 to 40 years	82	64.6 **	34	58.8
<u>Race/Ethnicity</u>				
Black	142	45.1 **	63	58.7
Hispanic	70	61.4 **	25	68.0
Caucasian	787	54.8 **	265	58.1
Other	43	39.5 **	15	53.3
<u>Education</u>				
NHSG	133	53.4	27	70.4
GED	122	53.3	45	62.2
HSG	668	54.8	244	59.0
College	102	45.1	49	49.0
<u>Family Status</u>				
Single no depns	101	48.5 ***	21	71.4
Single w/depns	597	52.9 ***	258	57.8
Married no depns	221	59.7 ***	61	54.1
Married w/depns	123	47.2 ***	30	70.0
<u>Good Years of Service</u>				
0 to 1	45	11.1 *	16	25.0 **
1 to 2	147	57.1 *	66	63.6 **
2 to 3	279	60.9 *	92	62.0 **
3 to 4	275	50.5 *	114	61.4 **
4 to 5	296	53.0 *	82	54.9 **
n (may vary due to missing cases on some variables)	1,042		370	

- \* significant at the .01 level  
 \*\* significant at the .05 level  
 \*\*\* significant at the .10 level

Source: Data extracted from the 1986 Reserve Components Survey.

About 45 percent of National Guard members in the ranks E1 to E2 are likely to stay in the Selected Reserves for the next year, versus 48 percent in the Army Reserves. Of those National Guard members who are 16 to 19 years old, nearly 50 percent intend to remain in the Reserves as compared to 60 percent in the Army Reserves. Nearly 13 percent more blacks, 7 percent more Hispanics and 3 percent more Caucasians will leave the National Guard than will their counterparts in the Army Reserves.

Intention to stay in the Reserves is fairly stable over educational status for National Guard members, with the exception of those who have some college education. College educated members leave at a rate of about 8 to 9 percentage points more than do less highly educated National Guard members. Army Reserve members exhibit somewhat different behavior among education sub-groups. Non-high school graduates seem to stay at a higher rate (70.4 percent) than the other groups with college educated members staying at a rate of 50 percent. The bivariate analysis seems to indicate that college educated members of both sub-populations can maximize their opportunities elsewhere.

Interesting differences were noted between National Guard and Reserve members in the family status variable. National Guard members who are married with dependents and who are single with no dependents leave at a rate of approximately 52 percent as compared to about 30 percent of

those Army Reserve members in the same sub-categories. For the variable, good years of service, the highest attrition rates occur for both National Guard and Army Reserve groups during the first year of service, 89 and 75 percent respectively. Clearly, behavior differences exist between non-prior active service members of the National Guard and the Army Reserves.

2. Bivariate Analysis of Prior Active Service Group

Table 4.2 displays the bivariate cross tabulation of intent to reenlist or extend, by selected explanatory variables, by Reserve component for the prior active service group. The intent to leave the Reserve forces is highest among National Guard members (36 percent) as compared to members of the Army Reserves (28 percent) in the prior active service groups. Members of the National Guard who are in pay grades E1 to E3 leave at about the same rate as do their Army Reserve counterparts (47 to 50 percent). E4's leave at a somewhat lower rate in the Army Reserve (25 percent) versus (34 percent) in the National Guard.

The entry age group, 16 to 19 years old, has an attrition rate of 33 percent in the National Guard versus 26 percent in the Army Reserve. For the second age group, 20 to 24 years old, attrition increases for both National Guard (42 percent) and Army Reserves (37 percent).

Nearly 16 percent more blacks, 2 percent more Hispanics, and 4 percent more Caucasians leave the National

TABLE 4.2

CROSS TABULATION OF INTENT TO REENLIST OR EXTEND  
BY SELECTED EXPLANATORY VARIABLES, BY RESERVE  
COMPONENT FOR THE PRIOR ACTIVE SERVICE GROUP

Explanatory Variable	Intent			
	ARNG		USAR	
	Freq.	Pct. Stayers	Freq.	Pct. Stayers
<u>Pay Grade</u>				
E1 to E3	51	52.9 ***	26	50.0 **
E4	237	66.2 ***	175	74.9 **
<u>Entry Age</u>				
16 to 19 years	214	66.8	152	73.7 ***
20 to 24 years	67	58.2	46	63.0 ***
25 to 40 years	7	28.6	3	100.0 ***
<u>Race/Ethnicity</u>				
Black	55	58.2	50	74.0
Hispanic	34	61.8	14	64.3
Caucasian	184	67.4	128	71.1
Other	15	46.7	8	75.0
<u>Education</u>				
NHSG	37	54.1	13	76.9
GED	40	77.5	35	82.9
HSG	168	64.3	130	68.5
College	39	59.0	22	72.7
<u>Family Status</u>				
Single no depns	28	53.6 **	24	75.0 ***
Single w/depns	91	56.0 **	80	62.5 ***
Married no depns	140	72.9 **	72	81.9 ***
Married w/depns	29	55.2 **	25	68.0 ***
<u>Good Years of Service</u>				
0 to 1	14	35.7 ***	7	57.1
1 to 2	61	62.3 ***	37	64.9
2 to 3	53	75.5 ***	34	76.5
3 to 4	67	64.2 ***	63	73.0
4 to 5	93	62.4 ***	60	73.3
n (may vary due to missing cases on some variables)	288		201	

\*\* significant at the .05 level

\*\*\* significant at the .10 level

Source: Data extracted from the 1986 Reserve Components Survey.

Guard than the Army Reserves. Other races/ethnic groups depart the National Guard at a rate twice that of the Army Reserve, 53 percent and 25 percent respectively.

Non-high school graduates in the National Guard leave the Reserve forces at a rate of 46 percent compared to 23 percent in the Army Reserve. High school graduates leave at about the same rate for both National Guard and Army Reserve groups, 36 percent and 32 percent respectively. College educated members of the National Guard leave at a rate of 41 percent versus 27 percent in the National Guard.

For the family status category, single with no dependents, National Guard members leave at a higher rate (46 percent) than do the same group in the Army Reserve (25 percent). Those married with no dependents have the lowest attrition rates for both the National Guard and Army Reserve than do any of the other family status sub-groups, 27 and 18 percent respectively. Dependents seem to influence the members to leave the Reserves.

The first year of service seems to be the most critical for both groups, since 64 and 43 percent respectively of National Guard and Army Reserve leave the forces during their first year. Again, clear differences exist in the behavior of National Guard and Army Reserve groups, both non-prior and prior active service. This study will attempt to identify those behavioral differences.



#### D. FACTOR ANALYSIS

Factor analysis, using the principal components method, was used to investigate the interrelationship of cognitive/perceptual explanatory variables for potential separation and combination into fewer variables. Factor analysis was used to determine behavioral differences in the cognitive/perceptual variables for both components by non-prior and prior active service. Virtually no differences were noted among sub-populations, indicating that factors developed at the aggregate level of the non-prior and prior active service groups could be used in the development of models below the aggregate level.

1. Factor Analysis of Participation Reasons (Questions Q26A to Q26N)

Questions Q26A to Q26N concern the reasons why people participate in the Guard/Reserve relative to their most recent decision to stay in the Guard/Reserve. Table 4.3 displays how specific questions loaded into the factors. The first factor seems to consist of things which are important in how an individual feels about himself and the military environment (quality of military life). The second factor loaded heavily with income related questions. And the third factor was composed of questions related to education and training. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.887 and the number of cases was 2,783. These three factors were used as constructed variables in the subsequent regression analysis.

TABLE 4.3

FACTOR LOADING FOR VARIABLES, RELATIVE TO THE  
REASONS PEOPLE PARTICIPATE IN THE GUARD/RESERVE

Factor	Variable	Variable Label
Quality of Life (QOL)	Q26N	stayed in, pride in accomplishments
	Q26M	stayed in, just enjoy Guard/Reserve
	Q26H	stayed in for challenge of military training
	Q26D	stayed in to serve with people in unit
	Q26F	stayed in for promotion opportunities
	Q26G	stayed in to use military equipment
	Q26A	stayed in to serve country
	Q26E	stayed in for credit toward retirement
Pecuniary Benefits (PB)	Q26L	stayed in for travel/to get away
	Q26J	stayed in for extra money to use now
	Q26I	stayed in, need money for family expenses
Education/ Training (ET)	Q26K	stayed in to save income for the future
	Q26B	stayed in to use educational benefits
	Q26C	stayed in for training re- civilian job

Source: Developed by the author.

2. Factor Analysis of Unit Training Problems  
(Questions Q43A to Q43O)

Questions Q43A to Q43O, as expressed in the member's opinion, attempt to isolate how much of a problem each feature is in meeting unit training objectives. Table 4.4

displays how specific questions loaded into the factors. The first factor loaded heavily with questions relating low attendance and personnel shortages to ineffective drills and Annual Training. The second factor loaded heavily with questions concerning shortcomings in unit drills (i.e., no resources, no access to good facilities/grounds, no good instruction manuals/materials, etc.). The third factor was composed of questions related to equipment/weapon condition and status. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.901 and the number of cases was 1,889. These three factors were also used as constructed variables in the subsequent regression analysis.

3. Factor Analysis of Satisfaction with Aspects of Unit Drills (Questions Q46 to Q54)

Questions Q46 to Q54 are related to how satisfied or dissatisfied an individual is with certain aspects of his unit during unit drills. This analysis resulted in two factors. Table 4.5 displays how specific questions loaded into the factors. The first factor loaded heavily with questions which are associated with opportunities available to the individual. The other factor loaded with questions which are associated with weapons/equipment used during unit drills. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.841 and the number of cases was 2,507. These two factors were also used as constructed variables in the subsequent regression analysis.

TABLE 4.4

FACTOR LOADING FOR VARIABLES, RELATIVE TO HOW MUCH OF A PROBLEM, AS EXPRESSED IN THE MEMBER'S OPINION, SPECIFIC FEATURES ARE IN MEETING UNIT'S TRAINING OBJECTIVES

Factor	Variable	Variable Label
Unit Personnel (UP)	Q43F	low attendance at drill
	Q43G	low attendance at Annual Training
	Q43J	low quality personnel in lower grades
	Q43C	grades E1-E4 below strength
	Q43D	grades E5-E9 below strength
	Q43I	shortage of MOS qualified personnel
	Q43H	ineffective Annual Training
Unit Resources (UR)	Q43L	plan objectives vs do paperwork
	Q43K	not enough drill time to practice skills
	Q43M	no access to good facilities/grounds
	Q43N	no good instruction manuals/materials
	Q43O	lack of supplies
	Q43E	no resources to plan effective training
Unit Weapons/ Equipment (UWE)	Q43A	outdated equipment/weapons
	Q43B	poor condition of equipment/weapons

Source: Developed by the author.

TABLE 4.5

FACTOR LOADING FOR VARIABLES CONCERNING THE MEMBERS'  
OPINION OF SPECIFIC FACETS OF THEIR RESPECTIVE UNIT

Factor	Variable	Variable Label
Opportunity Available (OA)	Q49	leadership opportunities in unit
	Q48	promotion opportunities in unit
	Q54	supervision/direction received during drill
	Q46	training received during unit drills
	Q47	opportunity to use MOS skills in drills
	Q53	morale of personnel in unit
Condition/Status Weapons/Equipment (CSWE)	Q52B	unit activities, Annual Training
	Q50	out-dated weapons/equipment
	Q51	mechanical condition of weapons/equipment

Source: Developed by the author.

4. Factor Analysis of Affective Aspects of Guard/Reserve Membership (Questions Q123A to Q123I)

Questions Q123A to Q123I address the member's level of satisfaction or dissatisfaction with certain features of the Guard/Reserve. Table 4.6 displays how specific questions loaded into the factors. The first factor loaded heavily with questions concerning satisfaction with extrinsic features such as military pay, allowances and benefits. The second factor consisted of questions concerning intrinsic features such as serving one's country

TABLE 4.6

FACTOR LOADING FOR VARIABLES CONCERNING THE MEMBERS' SATISFACTION WITH SPECIFIC FEATURES OF THE GUARD/RESERVE

Factor	Variable	Variable Label
Extrinsic Values (EV)	Q123A	military pay and allowances
	Q123B	commissary privileges
	Q123C	other military privileges
	Q123D	time required at Guard/Reserve
	Q123E	military retirement benefits
	Q123F	unit social activities
	Q123G	opportunities for education/training
Intrinsic Values (IV)	Q123H	opportunity to serve one's country
	Q123I	acquaintances/friendships

Source: Developed by the author.

and having friends and acquaintances. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.861 and the number of cases was 2,831. These two factors were also used as constructed variables in the subsequent regression analysis.

#### E. MODEL ESTIMATION

The decision to stay in or leave the Reserves is characterized as a dichotomous choice which takes the value of one if the member intends to stay and a value of zero if the intention is to leave. Consequently, each member will be characterized by an outcome variable defined as:

$$Y_i = \begin{cases} 0, & \text{if individual } i \text{ intends to leave; and} \\ 1, & \text{if individual } i \text{ intends to stay.} \end{cases}$$

The conditional logistic regression (logit) model is the appropriate choice for the functional form, since it restricts the value of the dependent variable to zero and one. This model relates the participation decision of the  $i^{\text{th}}$  individual,  $Y_i$ , to a vector of characteristics for that individual,  $x_i$ . The assumed relationship is:

$$Y_i = p(x_i) + e_i,$$

where,

$$p(x_i) = P[Y_i=1|x_i]$$

$$p(x_i) = \frac{1}{1 + e^{-(B_0 + B_1 x_{i1} + \dots + B_k x_{ik})}},$$

$k$  denotes the number of characteristics measured for each individual, and  $B_0, B_1, \dots, B_k$  are the parameters of the model to be estimated.

The following demographic, military experience explanatory variables were chosen for inclusion in the regression analysis: pay grade, education, marital status, number of dependents, current age and race/ethnicity. The ten factors discussed in the factor analysis above were also included in the regression; however, Q52B (satisfaction with unit's activities at 1985 Annual Training) had over 255 missing cases and was eliminated from the analysis.

As mentioned earlier, the scope of this analysis was restricted to non-prior and prior active service male populations due to the differences in patterns of attrition for males and females. To facilitate a discussion of the regression analysis results, certain reference categories of the explanatory variables were identified for the non-prior and prior active service groups based on frequency distributions of population characteristics discussed in Chapter III. The reference categories for both non-prior and prior active service groups were as follows: Caucasian, single and high school graduates (see Table 4.7). The reference pay grades were E1 to E3 for the non-prior and E4 for the prior active service groups. These reference categories were maintained to permit comparison of the results of regression analyses for the non-prior and prior active service groups, by Reserve component.

The explanatory variables were then coded as dichotomous choices for those values other than the reference categories, so that if the individual possesses the trait, the value is equal to one and to zero if he does not. The value ranges do not, in all cases, correspond to those presented in Chapter III, but were constructed as identified in previous research. Current age and the number of dependents were maintained as continuous variables. The value ranges are displayed in Table 4.8.



TABLE 4.7

REFERENCE INDIVIDUALS BY NON-PRIOR  
AND PRIOR ACTIVE SERVICE GROUP

Variable	Non-prior Active Service	Prior Active Service
Race/Ethnicity	Caucasian	Caucasian
Marital Status	Single	Single
Education	High School Graduate	High School Graduate
Pay Grade	E1 to E3	E4

Source: Developed by the author.

TABLE 4.8

VALUE CODING OF THE EXPLANATORY VARIABLES

<u>Variable</u>	<u>Description</u>
Current Age	Continuous
Race/Ethnicity	Black = 1; else = 0 Hispanic = 1; else = 0 Other = 1; else = 0
Marital Status	Married (1 2 5=1); else = 0
Number of Dependents	Continuous
Education	NHSG/GED (1 to 4= 1); else = 0 College (6 to 10 = 1); else = 0
Pay Grade	Non-prior active: E4 = 1; else = 0 Prior active: E1 to E3 = 1; else = 0
Factors	Continuous

Source: Variables were constructed by the author from questions taken from the 1986 Reserve Components Surveys.

## F. MODEL RESULTS

The results of the logit models developed to predict the intentions of a reservist, relative to the decision to stay in the Selected Reserve, are presented in the Appendix. The partial effects of individual explanatory variables on retention likelihood will be analyzed by first estimating the retention probability for the reference individual, and then calculating the change in retention likelihood for those members who differ from the reference category by an individual characteristic holding all other characteristics constant. The variables will be discussed within the categories: demographic, military experience and cognitive/perceptual as related to the groups of non-prior and prior active service.

Probabilities of retention were calculated at the mean values of all continuous explanatory variables used in the model. These probabilities represent the likelihood of the individual member's (in terms of average characteristics of the sample) intentions to stay in the Reserves.

By using dummy variables, comparisons can be made between sub-populations of the various groups. For example, Caucasian is the reference race, and the effect of being black, holding other characteristics constant, can be estimated by evaluating the logit equation using the coefficient of the black dummy variable and comparing the

resultant likelihood of reenlistment with that of the reference (Caucasian) individual.

The effect on retention likelihood of the continuous variables, number of dependents and current age, was calculated by increasing the respective mean by an increment of one unit at a time (holding all other explanatory variables constant except the one under observation) to observe changes in the probability of retention. The factors developed from the cognitive/perceptual variables were treated in much the same manner. Each factor was increased by one standard deviation from the mean (holding all other explanatory variables constant) to observe the change in the probability of retention. Tables 4.9 and 4.10 display a comparison of the effects of the explanatory variables on the probability of retention across Reserve components by non-prior and prior active service groups.

1. Model Results for Non-prior Active Service Group

a. Demographic Variables

As is consistent with the previous research findings discussed in Chapter II, demographic factors tend not to be statistically significant; however, they were included in this model for purposes of comparison between the non-prior and prior active service groups. For the reference individual (Caucasian, single, high school graduate) at the mean of each remaining independent

TABLE 4.9

RETENTION PROBABILITIES, BY RESERVE COMPONENT,  
BY NON-PRIOR ACTIVE SERVICE GROUP

Variable	Non-prior Service	
	ARNG change	USAR change
Reference Individual	.540	.661
Pay Grade		
E4	.073	.025
Education		
NHSG/GED	-.096	-.062
College	-.131	-.239
Marital Status		
Married	.122 ***	.034
Dependents		
Avg. +1 depn	-.002	.055
Current Age		
Avg. +1 yr	.007	.001
Race/Ethnicity		
Black	-.082	-.103
Hispanic	.095	-.074
Other	.158	.187
Factors (Avg. + 1s.d.)		
QOL	-.299 *	-.187 *
PB	.032	-.023
ET	-.157 *	-.166 *
UP	-.052	.048
UR	.032	-.013
UWE	.055	.017
OA	-.107 **	-.189 *
CSWE	-.052	-.057
EV	-.097 *	-.034
IV	-.152 *	-.090
n =	560	209

\* significant at the 1 percent level.

\*\* significant at the 5 percent level.

\*\*\* significant at the 10 percent level.

Source: Developed from data extracted from the 1986 Reserve Components Surveys.

TABLE 4.10

RETENTION PROBABILITIES, BY RESERVE COMPONENT,  
BY PRIOR ACTIVE SERVICE GROUP

Variable	Prior Service	
	ARNG change	USAR change
Reference Individual	.556	.914 **
Pay Grade E1 to E3	-.196	-.811 **
Education NHSB/GED	-.028	-.132
College	.148	.081
Marital Status Married	.262 ***	.083 **
Dependents Avg. +1 depn	.017	.009
Current Age Avg. +1 yr	-.010	.040
Race/Ethnicity Black	.052	.048
Hispanic	.214	.060
Other	-.142	.059
Factors (Avg. + 1s.d.)		
QOL	-.216 *	-.251 *
PB	-.104	.027
ET	-.294 *	-.134 ***
UP	.109	.050
UR	-.124	-.081
UWE	-.003	.031
OA	-.229 ***	-.568 *
CSWE	-.175 ***	-.029
EV	.018	-.066
IV	-.108	.028
n =	123	93

- \* significant at the 1 percent level.  
 \*\* significant at the 5 percent level.  
 \*\*\* significant at the 10 percent level.

Source: Developed from data extracted from the 1986 Reserve Components Surveys.

variable, the probability of retention was .540 and .661 for National Guard and Army Reserve, respectively.

The education variable had a negative coefficient for both non-high school graduates/GED as well as for college educated members and was not significant. The retention probability for a non-high school graduate/GED National Guard member decreased by nearly 10 percent. The probability for the same type of individual in the Army Reserve decreased by 6.2 percent. Retention probability of college educated members decreased by 13.1 and 23.9 percent for Guard and Reserve personnel, respectively.

As expected, marital status had a positive effect on retention likelihood. Marital status was significant at the 10 percent level for the Guard and not significantly different from zero for Reserve. Married members of both components were more likely to stay. Married Guard members increased 12.2 percent in their likelihood of staying, while married Reserve members showed a modest increase of 3.4 percent.

The number of dependents had a negative effect on retention intent of Guard members and a positive effect on Reserve members. The addition of one more dependent in the National Guard model only caused a 0.2 percent decrease in the likelihood of retention. The addition of one more dependent in the Reserve model resulted in an increase of 5.5 percent in retention probability.

Current age was not significant for either subgroup. The addition of one more year increased the probability of retention by a modest 0.7 and 0.1 percent for Guard and Reserve personnel, respectively.

Race/ethnicity variables were not significant for either sub-populations of the non-prior active service group. Blacks of both components were less likely to stay in the Reserves than Caucasians. Hispanics in the National Guard were more likely to stay than Hispanics in the Army Reserves. Other races/ethnic groups showed an increase in retention likelihood as compared to Caucasians. The likelihood of retention for blacks decreased by 8.2 and 10.3 percent for Guard and Reserve. The probability of retention for Hispanics in the Guard increased by 9.5 percent and decreased by 7.4 percent for Hispanics in the Reserve. Other races/ethnic groups of the Guard increased by nearly 16 percent in their retention probabilities and increased by 18.7 percent in the Reserve.

**b. Military Experience Variables**

As previously explained, the reference categories for both non-prior and prior active service groups were as follows: Caucasian, single and high school graduates. The reference pay grades were E1 to E3 and E4 for the non-prior and prior active service groups, respectively. The only military experience variable entered into the model was pay grade. Years of service and Reserve

component were used to select first term enlistees. Given the restricted ranges of pay grade (E1 to E4), it is not surprising that the effect of pay grade was not found to be significantly different from zero in either model.

c. Cognitive/Perceptual Variables

The factor representing the quality of life in the Reserves (QOL) was significant at the .01 level in both components. The coefficient was negative in both components indicating that dissatisfaction with those facets of military life, as displayed in Table 4.3, would lead to a lower probability of retention. An individual, one standard deviation above the average member, would exhibit a decrease in retention probability of 29.9 and 18.7 percent for Guard and Reserve, respectively.

The factor for pecuniary benefits (PB) was not significantly different from zero and had virtually no effect on retention intentions for either the Guard or Reserve. The factor for education and training (ET) was significant at the .01 level. The coefficient was negative in both components indicating that dissatisfaction with those facets of education/training would lead to a decrease in retention probability. When evaluated at one standard deviation away from the average, 15.7 and 16.6 percent decreases in the likelihood of retention was observed for Guard and Reserve personnel, respectively.



The factors representing the member's opinion of problem areas associated with unit drills (UP, UR, and UWE as displayed in Table 4.4), were not significant and had little effect on retention. Changes in retention probability ranged from -5.2 to 5.5 percent across both components.

The factor (OA displayed in Table 4.5) used to collectively analyze the availability of opportunities such as promotion and leadership, was found to be significant in both components. The loss of those types of opportunities would result in a decrease of 10.7 and 18.9 percent in the likelihood of retention for Guard and Reserve personnel, respectively.

The condition and status of weapons/equipment factor (CSWE) was not significantly different from zero. An individual one standard deviation away from the average member in opinion would show a decrease of about 5 percent for both components.

Satisfaction with extrinsic and intrinsic facets of the Guard/Reserve, as measured by the factors EV and IV (displayed in Table 4.6), were both found to be significant at the .01 level for the Guard non-prior service member. They were both not significant in the case of Reserve members. Dissatisfaction with facets like military pay and allowances, commissary and exchange privileges and retirement of the Guard/Reserve as accounted for in the

factor EV would result in a lowering of retention probabilities of 9.7 and 3.4 percent for Guard and Reserve, respectively. Dissatisfaction with intrinsic facets like serving one's country and making friends and acquaintances would decrease the likelihood of retention for Guard and Reserve members by 15.2 and 9.0 percent, respectively.

2. Model Results for Prior Active Service Group

a. Demographic Variables

As stated in the non-prior active service analysis presented above, demographic variables were found to be not statistically significant in predicting retention behavior. For the reference individual (Caucasian, single, high school graduate) at the mean of each remaining independent variable, the probability of retention was .556 and .914 for National Guard and Army Reserve, respectively.

Again, education was not significantly different from zero, and had very little effect on retention likelihood. Non-high school graduates in the Guard were less likely to stay by about 3 percent vice 13.2 percent in the Reserve. College educated Reservists were more likely to stay by about 15 percent in the Guard and 8 percent in the Reserve.

Marital status was significant at the 10 percent level for the Guard and at the 5 percent level for Reserve. Married members in the Guard were 26.2 percent more likely to stay, as were married members in the Reserve being 8.3

more likely to stay than their respective reference individuals.

The number of dependents had virtually no effect on retention behavior. An addition of one more dependent above the average only increased the retention likelihood by 1.7 percent in the Guard and less than 1 percent in the Reserve.

Current age was also found to be not significant in predicting retention likelihood. A Guard member who was one year older than the average member would exhibit a decrease in retention probability by 1 percent. A Reserve member one year older than the average would show an increase of 4 percent in retention.

The race/ethnicity variable was not significantly different from zero. All sub-groups exhibited positive coefficients except the other races/ethnic groups in the National Guard. Blacks in both components would be more likely to stay by about 5 percent than would their Caucasian counterparts. Hispanics in the Guard were 21.4 percent more likely to stay than Caucasians, and Reserve Hispanics were also more likely to stay by 6 percent as compared to their Caucasian counterparts. The other races/ethnic group was shown to have a 14.2 percent decrease in retention in the Guard and a 5.9 percent increase in the Reserve.

b. Military Experience Variables

The reference pay grades were E1 to E3 and E4 for the non-prior and prior active service groups, respectively. Again, good years of service and Reserve component were used to define the population to be analyzed. Pay grade was not significant in the Guard model; however, it was significant at the .05 level in the Reserve model. In moving from the reference pay grade to the E1 to E3 group, retention likelihood decreases by nearly 20 percent in the Guard and over 81 percent in the Reserve.

c. Cognitive/Perceptual Variables

Quality of life (QOL) was significant at the .01 level for both Guard and Reserve. Dissatisfaction with those things inherent to the quality of life (see Table 4.3) would result in a lowering of retention by 21.6 and 25.1 percent for the Guard and Reserve, respectively, when considering an individual with one standard deviation difference from the mean.

Pecuniary benefits (PB) were found to be not significant and did not contribute to retention. This may attest to the fact that income or monetary wealth is not a key ingredient to the decision process for Reservists.

The education and training related factor (ET) was found to be significant at the .01 level for Guard and at the .10 level for Reserve. If an individual was different from his peers by one standard deviation in

dissatisfaction with education/training facets, that difference would lead to a decrease of 29.4 and 13.4 percent for Guard and Reserve, respectively.

Again, factors associated with the member's perceptions of how much of a problem certain features are in meeting the unit's training objectives (Factors UP, UR, UWE as displayed in Table 4.4) were all not significant. The factor (OA displayed in Table 4.5) used to collectively analyze the availability of opportunities such as promotion and leadership, was found to be significant in both components (10 percent level for the Guard and 1 percent level for the Reserve). The loss of those types of opportunities would result in a decrease of 22.9 and 56.8 percent in the likelihood of retention for Guard and Reserve personnel, respectively.

The condition and status of weapons/equipment factor (CSWE) was not significantly different from zero for the Reserve, but was significant for the Guard at the .10 level. An individual one standard deviation away from the average member in opinion would show a decrease of about 18 percent for Guard and only 2.9 percent for Reserve.

Satisfaction with extrinsic and intrinsic facets of the Guard/Reserve, as measured by the factors EV and IV (displayed in Table 4.6), were found to be not significant for the Guard and Reserve. Dissatisfaction with facets like military pay/allowances, commissary and exchange privileges

and Reserve retirement would result in lower retention for both components. Dissatisfaction with intrinsic facets like serving one's country and making friends and acquaintances would decrease the likelihood of retention for Guard and Reserve members.

#### G. ASSESSMENT OF MODEL VALIDITY

To examine the validity of the models developed to predict retention intent by non-prior and prior active service groups, the partial effects of the predicted probabilities of retention were calculated as displayed in Tables 4.9 and 4.10. Predicted retention intent based on the models was compared to observed retention intent as expressed by the member in response to the 1986 Reserve Components Surveys. All four models were creditable in their abilities to correctly predict intentions. As shown in Tables 4.11 to 4.14, the overall accuracy of the non-prior and prior active service models, by component, were 78.9 percent (NPS ARNG), 78.5 percent (NPS USAR), 86.2 percent (PS ARNG) and 90.3 percent (PS USAR) correct predictions, as compared to respective observed rates of reenlistment intentions of 53.3 percent (NPS ARNG), 58.9 percent (NPS USAR), 63.9 percent (PS ARNG) and 71.6 percent (PS USAR).

TABLE 4.11

CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED  
REENLISTMENT INTENTION FOR THE ARMY NATIONAL GUARD,  
NON-PRIOR ACTIVE SERVICE GROUP

		Predicted Intention	
		leave	stay
Observed Intention	leave	74.1%	25.9%
	stay	23.4%	82.6%

n = 560

Observed proportion staying: 53.3%

Proportion of the total correctly classified: 78.9%

Source: Constructed by the author from data extracted  
from the 1986 Reserve Components Surveys.

TABLE 4.12

CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED  
REENLISTMENT INTENTION FOR THE ARMY RESERVE,  
NON-PRIOR ACTIVE SERVICE GROUP

		Predicted Intention	
		leave	stay
Observed Intention	leave	66.2%	19.6%
	stay	25.4%	86.0%

n = 209

Observed proportion staying: 58.9%

Proportion of the total correctly classified: 78.5%

Source: Constructed by the author from data extracted  
from the 1986 Reserve Components Surveys.

TABLE 4.13

CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED  
REENLISTMENT INTENTION FOR THE ARMY NATIONAL GUARD,  
PRIOR ACTIVE SERVICE GROUP

		Predicted Intention	
		leave	stay
Observed Intention	leave	77.8%	12.3%
	stay	16.7%	91.0%

n = 123

Observed proportion staying: 63.9%

Proportion of the total correctly classified: 86.2%

Source: Constructed by the author from data extracted  
from the 1986 Reserve Components Surveys.

TABLE 4.14

CONTINGENCY TABLE, COMPARISON OF ACTUAL AND PREDICTED  
REENLISTMENT INTENTION FOR THE ARMY RESERVE,  
PRIOR ACTIVE SERVICE GROUP

		Predicted Intention	
		leave	stay
Observed Intention	leave	76.2%	6.8%
	stay	20.0%	94.4%

n = 93

Observed proportion staying: 71.6%

Proportion of the total correctly classified: 90.3%

Source: Constructed by the author from data extracted  
from the 1986 Reserve Components Surveys.



The models developed in this chapter have sufficient levels of accuracy to be accepted as good explanatory models of Reserve retention. Chapter V will discuss augments to the data and modeling efforts that would improve these models for gaining additional insight of the potential effects of Reserve management policies.

## V. CONCLUSIONS AND RECOMMENDATIONS

Department of the Army policy makers and commanders should understand how policy changes can affect personnel motivation, adjustment to the military and ultimately retention. The findings of this study contribute to the understanding of the factors influencing retention, and provide insights which policy makers can use to effectively manage Reserve retention.

This thesis estimated a turnover model to analyze Reserve participation of first-term enlisted males in the Selected Reserves. The final model consisted of three categories of explanatory variables to explain the Reserve participation decision: demographic, military experience and cognitive/perceptual. Figure 5.1 shows the final model used in the analysis.

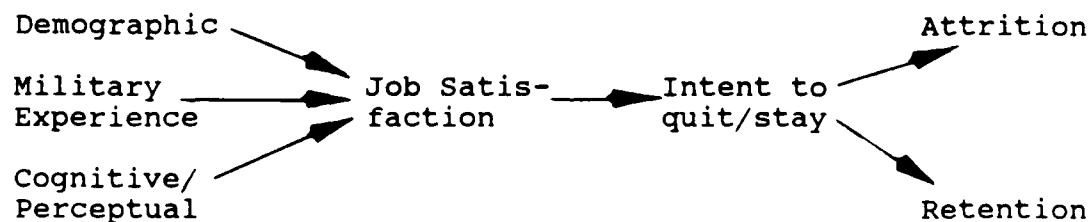


Figure 5.1 Final Turnover Process Model

Reserve participation intentions were presented in Chapter IV with the indication that demographic and

experience variables were not consistently significant in their influence of the Reserve participation decision. It was theorized that older, married members with dependents would have a higher likelihood of retention.

The amount of education a member had completed was theorized to affect his likelihood of staying. It was also predicted that blacks would be less likely to stay in the Reserves, and that Hispanics would be more likely.

It was also theorized that members who were dissatisfied with certain specific facets of the Reserve would be less likely to stay. Table 4.8 shows that satisfaction with promotion opportunity, leadership opportunity, MOS skill utilization, training, unit morale and supervision/direction received during unit drills was consistently significant across all groups. Cognitive/perceptual variables in composite factor form were consistently significant for quality of military life, and education/training as major contributors to the decision to remain in the Reserves. The overall accuracy of the respective non-prior and prior active service models, by component, were 78.9 percent (NPS ARNG), 78.5 percent (NPS USAR), 86.2 percent (PS ARNG) and 90.3 percent (PS USAR) correct predictions.

#### A. CONCLUSIONS

##### 1. Demographic Variables

The only demographic variable found to be somewhat consistently significant, with the exception of the

non-prior active service Army Reserve group, in explaining Reserve retention across groups was the married variable. Current age of Reserve members in this sample did not have an appreciable affect on retention. The number of dependents also was not significant in explaining Reserve retention.

Though education was not significant, changes in retention could be attributed to both ends of the spectrum around high school graduates. The college educated members of the prior active service Army Reserve group showed decreased likelihood of staying in the Reserves. Those members who were not high school graduates also were less likely to stay in the Reserves.

Race/ethnicity had mixed affects, though not significant. Blacks exhibited a tendency to have lower retention probabilities in the National Guard than in the Army Reserve. Hispanics were more likely to stay in the Reserves for all groups except non-prior active service Army Reserve. Other races/ethnic groups showed increased likelihood of retention in all groups except prior service Army Reserve.

## 2. Military Experience Variables

As previously discussed, the only military experience variable entered into the model was pay grade. Reserve component and good years of service were used to select groups of first-term enlistees by component in the analysis.

Pay grade was significant in the prior active service Army Reserve model only with a negative influence if the member was in the pay grades E1 to E3. The likelihood of retention was decreased 20 and 81 percent for prior active service Guard and Reserve, respectively.

### 3. Cognitive/Perceptual Variables

The only composite factors of the cognitive/perceptual variables found to have a significant affect on Reserve retention were quality of life (QOL), satisfaction with education/training (ET) facets of the Reserve and opportunity (OA) for such things as promotion, leadership and MOS skill utilization. Generally, the more dissatisfied the member is with the specific facets of the Reserves, the less likely he is to remain in the Reserves. An interesting observation was that questions measuring contribution to the most recent decision to stay in the Guard/Reserve in terms of income (e.g., needed the money for basic family expenses; wanted extra money to use now and saving income for the future), were found not significant in this sample. This suggests that possibly, the individuals are participating in the Reserves for some reason other than an additional source of income.

## B. IMPLICATIONS

Tables 4.8 and 4.9 show the results of the Selected Reserve retention models for non-prior and prior active service groups, by component and reservist characteristics.

The results indicate that the probability of retention after first-term enlistment for the reference individual is much higher in the Army Reserve for non-prior active service (66.1 percent) than the National Guard counterpart (54 percent). The same results are evident for the reference individual in the prior active service group. The probability of retention for prior active service members is higher in the Army Reserve (91.4 percent) than in the National Guard (55.6 percent).

These results bring up a number of interesting policy questions in the area of Reserve turnover, many of which need additional study efforts. Major areas of Reserve personnel policy attention may be:

- Standardization of recruiting efforts
- Determination of appropriate mixes of non-prior and prior active service enlistments
- Family support policies
- Civilian employer policies.

Recruiting standards of the two components may differ because each component requires a particular mix of MOS skills: combat skills for the Guard and combat support/ combat service support skills for the Reserve. The large differences in retention probability between components may be related to the role differences of the components themselves. Mission requirements in the combat arms are more demanding (e.g., emphasis on physical capability, stressful environment) than are combat support and combat

service support, and these differences in requirements suggest different standards. This thesis seems to support different recruiting standards because behavioral differences in retention probability exist between the Guard and the Reserve.

The next obvious question concerns the use of prior active service personnel in place of non-prior active service personnel. Prior active service personnel are often highly trained and should be more productive in their jobs because of the experience factor. This thesis has demonstrated the differences in retention intent between non-prior and prior active service personnel. Prior active service personnel retention was 1.6 and 25.3 percent higher for first term Guard and Reserve, respectively, as compared to non-prior active service personnel for both components.

Though the sample indicated that only 1.6 percent difference in retention intent exists between Guard non-prior and prior active service groups, the lesser training costs and increased productivity could be significant in lowering overall costs of manning the Guard. A 25 percent difference (increase in retention likelihood for prior service members) between non-prior and prior active service for the Army Reserve indicates the dramatic savings that can be generated by tapping the prior active service manpower source. Obvious restraining factors which must be considered by both components when viewing non-prior and

prior service mixes are what the effects may be on the promotion opportunities of non-prior active service personnel when accepting lateral entry of prior active service personnel, the availability of certain skills coming off Active duty and what grade vacancies are more apt to require experienced personnel.

Spouse and civilian influences on the participation decision were not analyzed in this thesis; however, they have been traditionally viewed as having some effect on retention decisions. Measures to communicate to the civilian employers what exactly being a member of the Guard/Reserve have already begun. Several Reserve units are now holding "civilian employers' day" to demonstrate what is required of their personnel when they are functioning in their roles of part time soldier.

Family support issues are just as important in the Reserve member's mind as they are in the Active duty member's mind. By opening the door to increased non-pecuniary benefits like commissary and exchange privileges for Reserve family members will serve to positively influence the members participation decision. Or possibly, programs designed around the new spouse or young children to better communicate what the member does in his "weekend warrior" role. Better communication with civilian employers and family members will identify problem areas which when



analyzed for possible solution will aid in the formulation of policies targeted specifically at retention behavior.

#### C. RECOMMENDATIONS FOR FURTHER STUDY

The influences of spouse and civilian employer have not been addressed in this model. The fact that members must choose to give up leisure and family time to participate in the Guard/Reserve may account for some of the variation in reenlistment intent not explained in this model. Competing civilian markets are attractive alternatives to members who have already acquired a vast amount of general training. These alternatives could provide additional insight into the Reserve participation decision.

Extensive preliminary analysis showed the existence of important behavior differences between males and females. Women have markedly different attrition patterns, given the probability occurrence of factors such as marriage and childbearing, spouse conflict, migration and physical ability. Bivariate analysis of gender, relative to the decision to continue participation in some category of the Reserves, revealed a tendency for women to request a transfer to Active duty at a higher rate than their male counterparts in the National Guard and the Army Reserve. Theoretical differences presented above and results from preliminary analysis suggests different behaviors and indicate that separate models should be undertaken to explain female attrition.

The survey used in this analysis resulted in a data base to which files can be matched and merged with the Reserve Components Common Personnel Data System. Subsequent actual retention behavior could then be matched with what the members stated their intentions to be. The relative importance of demographic, military experience and cognitive/perceptual factors to actual retention behavior could then be assessed.

Additionally, a serious drawback of the current data could be addressed by matching these files to the Reserve Components Common Personnel Data System and Army Finance Data Systems. Such matching would permit the development of income variables which would in turn, permit the analysis of the importance of the moonlighting theory relative to the Reserve participation decision.

Application of a polytomous logit model to a single discrete choice problem with multiple options such as: stay in the Selected Reserves, leave the Reserves and transfer to Active duty, leave the Selected Reserves and transfer to the Individual Ready Reserves, or leave the Guard/Reserves all together would offer additional insight. A comparison of the results could then be made with the findings of this thesis.

The participation decision is a very complex issue, certainly more complex than a simple dichotomous stay/leave decision. The above stated recommendations could provide

additional understanding of the turnover process relative to the Reserve forces and support more efficient and effective management policies.

APPENDIX

LOGIT MODEL OF RETENTION, BY RESERVE COMPONENT,  
BY NON-PRIOR AND PRIOR ACTIVE SERVICE GROUP

Table A.1 displays the conditional logistic regression (logit) models for first-term enlisted males in the U.S. Army Selected Reserves. The models are established by non-prior and prior active service, by respective Reserve component.

TABLE A.1

LOGIT MODEL OF RETENTION, BY RESERVE COMPONENT,  
BY NON-PRIOR AND PRIOR ACTIVE SERVICE GROUP

Variable	Non-prior Service		Prior Service	
	ARNG	USAR	ARNG	USAR
Intercept	-.224	.562	.897	9.306**
Pay Grade				
E1 to E3			-.798	-4.523**
E4	.299	.114		
Education				
NHSG/GED	-.387	-.267	-.114	-1.084
College	-.530	-.348	.642	2.927
Marital Status				
Married	.513***	.158	1.279***	3.303**
Dependents	-.007	.259	.071	.261
Current Age	.021	-.003	-.040	-.284
Race/Ethnicity				
Black	-.331	-.436	.213	.875
Hispanic	.390	-.315	.988	1.241
Other	.676	1.050	-.573	1.221
Factors				
QOL	-1.222*	-.864*	-1.137*	-2.687*
PB	.132	-.086	-.490	.455
ET	-.645*	-.710*	-1.286*	-1.018***
UP	-.217	.169	.444	.703
UR	.162	-.058	-.442	-.829
UWE	.216	.080	-.014	.511
OA	-.447**	-.697*	-.771***	-2.502*
CSWE	-.196	-.260	-.960***	-.328
EV	-.387*	-.129	.062	-.587
IV	-.623*	-.417	-.538	.607
n =	560	209	123	93

\* significant at the 1 percent level.

\*\* significant at the 5 percent level.

\*\*\* significant at the 10 percent level.

Source: Developed from data extracted from the 1986 Reserve Components Surveys.

### LIST OF REFERENCES

1. Defense Manpower Data Center, Official Guard and Reserve Manpower Strengths and Statistics, RCS: DD-RA(M) 1147/1148, Arlington, Virginia, March 1987.
2. U.S. Army Research Institute for Behavioral and Social Sciences Research Report 1427, Recommendations for "People Research and Development" Actions to Improve Army Reserve Component Readiness, by James A. Bynum, M.A. Fischl, February 1986.
3. Rand Research Report R-2864-MRAL, The 1978 Selected Reserve Reenlistment Bonus Test, by D. Grissmer, B. Burrigh, Z. Doering and J. Sachar, April 1982.
4. Rand Research Report R-2864-MRAL, The 1978 Selected Reserve Reenlistment Bonus Test, by D. Grissmer, B. Burrigh, Z. Doering and J. Sachar, p. 21, April 1982.
5. U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 380, Marital Status and Living Arrangements, Washington, D.C., March 1982.
6. Haber, S., Lamas, E. and Green, G., "A New Method for Estimating Job Separation by Sex and Race," Monthly Labor Review, V. 106, No.6, June 1983.
7. Rand Report R-3069-MIL, Analysis of Early Military Attrition, by R. Buddin, July 1984.
8. U.S. Army Research Institute for Behavioral and Social Sciences Research Report 478, Correlates of Military Satisfaction and Attrition Among Army Personnel, by Allen, J. and Bell, D., July 1980.
9. Motowidlo, S., and Lawton, G., "Affective and Cognitive Factors in Soldiers' Reenlistment Decisions," Journal of Applied Psychology, V. 69, pp. 157-166, 1984.
10. Cotton, J., and Tuttle, J., "Employee Turnover: A Meta-Analysis and Review with Implications for Research," Academy of Management Review, V. 11, No. 1, pp. 55-70, 1986.

11. U.S. Army Recruiting Command Study Report 86-10, A Preliminary Analysis of Enlisted Attrition in the Army Reserve, by Thomas, G., Albiso, C., Buscher, K., and Kocher, K., November 1986.
12. Rostker, B., and Shishko, R., "The Economics of Multiple Job Holding," American Economic Review, V. 66, No. 3, June 1976.
13. McCormick, E., and Ilgen, D., Industrial Psychology, 7th ed., Prentice-Hall, 1980.
14. Locke, E., Handbook of Industrial and Organizational Psychology, Rand McNally, 1969.
15. Mobley, W., and Locke, E., Organizational Behavior and Human Performance, V. 5, pp. 463-483, 1970.
16. Maslow, A., Motivation and Personality, Harper and Row, 1970.
17. Herzberg, F., Mausner, B. and Snyderman, B., The Motivation of Work, John Wiley and Sons, 1959.
18. Porter, L., and Lawler, E., Managerial Attitudes and Performance, Richard D. Irwin Publishers, 1968.
19. Landy, F., and Trumbo, D., Psychology of Work Behavior, Dorsey Press, 1980.
20. Lawler, E., Pay and Organizational Effectiveness: A Psychological View, McGraw-Hill, 1971.
21. Muchinsky, P., and Tuttle, M., Journal of Vocational Behavior, V. 17, pp. 263-290, 1979.
22. Mobley, W., "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," Journal of Applied Psychology, V. 62, pp. 237-240, 1977.
23. Mobley, W., Horner, S. and Hollingsworth, A., "An Evaluation of Precursors of Hospital Employee Turnover " Journal of Applied Psychology, V. 63, pp. 408-414, 1978.
24. Miller, H., Katerburg, R. and Hulin, C., "Evaluation of the Mobley, Horner and Hollingsworth Model of Employee Turnover," Journal of Applied Psychology, V. 64, pp. 509-517, 1979.

25. Michaels, C., and Spector, P., "Causes of Employee Turnover: A Test of the Mobley, Griffeth, Hand, and Meglino Model," Journal of Applied Psychology, V. 67, pp. 53-59, 1982.
26. Dalessio, A., Silverman, W. and Schuck, J., "Paths to Turnover: A Re-analysis and Review of Existing Data in the Mobley, Horner, and Hollingsworth Turnover Model," Human Relations, V.39, pp. 245-263, 1986.
27. Mobley, W., Griffeth, R., Hand, H., and Meglino, B., "Review and Conceptual Analysis of the Employee Turnover Process," Psychological Bulletin, V. 86, pp. 493-522, 1979.
28. Bluedorn, A., "A Unified Model of Turnover From Organizations," Human Relations, V. 35, pp. 135-153, 1982.
29. Steers, R., and Mowday, R., "Employee Turnover and Post-decision Accomodation Processes," Research in Organizational Behavior, V. 3, pp. 235-281, 1981.
30. Mowday, R., Porter, L. and Steers, R., Employee-organizational Linkages, Academic Press, 1982.
31. Arnold, H., and Feldman, D., "A Multivariate Analysis of the Determinants of Job Turnover," Journal of Applied Psychology, V. 67, pp. 350-360, 1982.
32. Defense Manpower Data Center, 1986 Reserve Components Survey of Enlisted Personnel and Their Spouses, Arlington, Virginia, 1986.



## BIBLIOGRAPHY

- Albiso, C. and Buscher, K., A Multivariate Analysis of Enlisted Attrition in the Army Reserve, M.S. Thesis, Naval Postgraduate School, Monterey, California, December 1985.
- Allen, J., Military, Biographical and Demographic Correlates of Army Career Intentions, U.S. Army Research Institute for the Behavioral and Social Sciences, Technical Report 518, June 1981.
- Allen, J., Correlates of Military Satisfaction and Attrition Among Army Personnel, U.S. Army Research Institute for the Behavioral and Social Sciences, Technical Report 478, July 1980.
- Arnold, H., and Feldman, D., "A Multivariate Analysis of the Determinants of Job Turnover," Journal of Applied Psychology, V.67, pp. 350-360, 1982.
- Barclay, S., A Preliminary Analysis of the Costs and Benefits of Older Age Accessions, M.S. Thesis, Naval Postgraduate School, Monterey, California, March 1984.
- Barnson, W., Accession and Retention of the Enlisted Reservist: A Look at Incentives, Air Command and Staff College Research Report 0110-78, Maxwell Air Force Base, Alabama, May 1978.
- Binkin, M., and Eitelberg, M., Blacks and the Military, The Brookings Institution, Washington, D.C., 1982.
- Binkin, M., and Kyriakopoulos, I., Youth or Experience? Manning the Modern Military, The Brookings Institution, Washington, D.C., 1979.
- Binkin, M., US Reserve Forces--The Problem of the Weekend Warrior, The Brookings Institution, Washington, D.C., 1974.
- Bluedorn, A., "A Unified Model of Turnover From Organizations," Human Relations, V. 35, pp. 135-153, 1982.
- Brinkerhoff, J., and Grissmer, D., The Reserve Forces in an All-Volunteer Environment, Pergamon-Brassey's International Defense Publishers, McLean, Virginia, 1986.

- Brown, J., A Review of Military Recruiting Research, M.S. Thesis, Naval Postgraduate School, Monterey, California, June 1984.
- Buddin, R., Analysis of Early Military Attrition Behavior, Rand Corporation, R-3069-MIL, Santa Monica, California, July 1984.
- Burright, B., Grissmer, D. and Doering, Z., A Model of Reenlistment Decisions of Army National Guardsmen, Rand Corporation R-2866-MRAL, Santa Monica, California, October 1982.
- Bynum, J., and Fischl, M., Recommendations for "People Research and Development" Actions to Improve Army Reserve Component Readiness, U.S. Army Research Institute for the Behavioral and Social Sciences, Research Report 1427, February 1986.
- Coffey, K., Manpower for Military Mobilization, American Enterprise Institute for Public Policy Research, Washington, D.C., 1978.
- Cotton, J., and Tuttle, J., "Employee Turnover: A Meta-Analysis and Review with Implications for Research," Academy of Management Review, V. 11, No. 1, pp. 55-70, 1986.
- Dalessio, A., Silverman, W. and Schuck, J., "Paths to Turnover: A Re-analysis and Review of Existing Data in the Mobley, Horner, and Hollingsworth Turnover Model," Human Relations, V.39, pp. 245-263, 1986.
- Defense Manpower Data Center, 1986 Reserve Components Survey of Enlisted Personnel and Their Spouses, Arlington, Virginia, 1986.
- Defense Manpower Data Center, Official Guard and Reserve Manpower Strengths and Statistics, RCS: DD-RA(M) 1147/1148, March 1987.
- Doering, Z., and Grissmer, D., Active and Reserve Force Attrition and Retention: A Selected Review of Research Methods, Rand Corporation P-7077, Santa Monica, California, March 1985.
- Eastburn, C., All Volunteer Force: The Retention Problem in the US Army Reserve, Air War College Research Report 327, Maxwell Air Force Base, Alabama, April 1978.

General Accounting Office, Comptroller General of the United States, Attrition in the Military--An Issue Needing Management Attention, Washington, D.C., February 1980.

General Accounting Office, Comptroller General of the United States, DOD "Total Force Management"--Fact or Rhetoric?, Washington, D.C., January 1979.

General Accounting Office, Comptroller General of the United States, Personnel Problems May Hamper Army's Individual Ready Reserve in Wartime, Washington, D.C., January 1983.

Gray, R., Influences of High Quality Army Enlistments, M.S. Thesis, Naval Postgraduate School, Monterey, California, March 1987.

Grissmer, D., and Kirby, S., Attrition of Nonprior-Service Reservists in the Army National Guard and Army Reserve, Rand Corporation R-3267-RA, Santa Monica, California, October 1985.

Grissmer, D., and Kirby, S., Attrition and Retention in the Army Reserve and Army National Guard: An Empirical Analysis, Rand Corporation P-7077, Santa Monica, California, March 1985.

Grissmer, D., Burright, B., Doering, Z., and Sachar, J., The 1978 Selected Reserve Reenlistment Bonus Test, Rand Corporation R-2864-MRAL, Santa Monica, California, April 1982.

Grissmer, D., and Kirby, S., Attrition During Training in the Army Reserve and Army National Guard, Rand Corporation N-2079-RA, Santa Monica, California, August 1984.

Haakestad, T., The Relationship Between Reenlistment Intentions and Reserve Participation Within the Armed Forces, M.S. Thesis, Naval Postgraduate School, Monterey, California, December 1986.

Haber, S., Lamas, E. and Green, G., "A New Method for Estimating Job Separation by Sex and Race," Monthly Labor Review, V. 106, No. 6, Bureau of the Census, June 1983.

Herzberg, F., Mausner, B. and Snyderman, B., The Motivation of Work, John Wiley and Sons, New York, New York, 1959.

- Kirkland, F., Raney, J. and Hicks, J., Reenlistment in the US Army Reserve, U.S. Army Research Institute for the Behavioral and Social Sciences, Technical Report 641, July 1984.
- Lamboni, M., An Analysis of Reenlistment and Reserve Intentions of First Term Enlisted Personnel, M.S. Thesis, Naval Postgraduate School, Monterey, California, June 1987.
- Landy, F., and Trumbo, D., Psychology of Work Behavior, Dorsey Press, Chicago, Illinois, 1980.
- Lawler, E., Pay and Organizational Effectiveness: A Psychological View, McGraw-Hill, New York, New York, 1971.
- Locke, E., Handbook of Industrial and Organizational Psychology, Rand McNally, Skokie, Illinois, 1969.
- Market Factors, Inc., Conjoint Analysis of Values of Reserve Component Attributes, Chicago, Illinois, November 1977.
- Maslow, A., Motivation and Personality, Harper and Row, New York, New York, 1970.
- McCormick, E., and Ilgen, D., Industrial Psychology, 7th ed., Prentice-Hall, Englewood Cliffs, New Jersey, 1980.
- Mehay, S., Second Job Holding and Reserve Participation: Are They the Same?, unpublished paper, November, 1987.
- Michaels, C., and Spector, P., "Causes of Employee Turnover: A Test of the Mobley, Griffeth, Hand, and Meglino Model," Journal of Applied Psychology, V. 67, pp. 53-59, 1982.
- Miller, H., Katerburg, R. and Hulin, C., "Evaluation of the Mobley, Horner and Hollingsworth Model of Employee Turnover," Journal of Applied Psychology, V. 64, pp. 509-517, 1979.
- Mobley, W., and Locke, E., Organizational Behavior and Human Performance, V. 5, pp. 463-483, 1970.
- Mobley, W., "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," Journal of Applied Psychology, V. 62, pp. 237-240, 1977.
- Mobley, W., Horner, S. and Hollingsworth, A., "An Evaluation of Precursors of Hospital Employee Turnover," Journal of Applied Psychology, V. 63, pp. 408-414, 1978.

- Mobley, W., Griffeth, R., Hand, H., and Meglino, B., "Review and Conceptual Analysis of the Employee Turnover Process," Psychological Bulletin, V. 86, pp. 493-522, 1979.
- Motowidlo, S., and Lawton, G., "Affective and Cognitive Factors in Soldiers' Reenlistment Decisions," Journal of Applied Psychology, V. 69, pp. 157-166, 1984.
- Mowday, R., Porter, L., and Steers, R., Employee-organizational Linkages, San Fransisco: Academic Press, 1982.
- Muchinsky, P., and Tuttle, M., Journal of Vocational Behavior, V. 17, pp. 263-290, 1979.
- Nadel, A., and Mowbray, J., Motivation and Retention in the US Army, U.S. Army Personnel Research Office, Research Study 66-5, September 1966.
- Porter, L., and Lawler, E., Managerial Attitudes and Performance, Richard D. Irwin Publishers, Homewood, Illinois, 1968.
- Rostker, B., and Shishko, R., The Economics of Multiple Job Holding, American Economic Review, V. 66, No. 3, June 1976.
- Steers, R., and Mowday, R., "Employee Turnover and Post-decision Accomodation Processes," Research in Organizational Behavior, V. 3, pp. 235-281, 1981.
- Sterling, B., and Allen, J., Relationships Among Organizational Attitudes, Work Environment, Satisfaction with Human Resource Programs and Benefits and Army Career Intentions, U.S. Army Research Institute for the Behavioral and Social Sciences, Technical Report 572, July 1983.
- Terza, J., and Warren, R., US Army Reenlistment and Extension by Occupation: A Reduced-Form Trinomial Probit Approach, U.S. Army Research Institute for the Behavioral and Social Sciences, Technical Report 719, July 1986.
- Thomas, D., Attrition in the US Army: An Exploratory Data Analysis Approach, M.S. Thesis, Naval Postgraduate School, Monterey, California, June 1984.

Thomas, G., Albiso, C., Buscher, K., and Kocher, K., A Preliminary Analysis of Enlisted Attrition in the Army Reserve, U.S. Army Recruiting Command Study Report 86-10, Fort Sheridan, Illinois, November 1986.

U.S. Bureau of the Census, Marital Status and Living Arrangements, Current Population Reports, Series P-20, No. 380, March 1982.

INITIAL DISTRIBUTION LIST

	No. Copies
1. Defense Technical Information Center Cameron Station Alexandria, Virginia 22304-6145	2
2. Library, Code 0142 Naval Postgraduate School Monterey, California 93943-5002	2
3. Department of the Army Deputy Chief of Staff, Personnel Directorate of Manpower and Budget Attn: DAPE-MBU Washington, D.C. 20310-0300	1
4. Commander United States Army Manpower Requirements and Documentation Agency Fort Belvoir, Virginia 22332-0300	1
5. Professor George W. Thomas, Code 54Te Naval Postgraduate School Monterey, California 93943-5000	6
6. Professor Stephen L. Mehay, Code 54Mp Naval Postgraduate School Monterey, California 93943-5000	5
7. Mr. Donald D. Fithian, Jr. c/o Mr. David C. Hite 3933 Moss Rose Drive Nashville, Tennessee 37216	1