Technical Report 831

The Determinants of Attrition From the Army Selected Reserves

Charles Dale

March 1989

United States Army Research Institute
for the Behavioral and Social Sciences

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency Under the Jurisdiction of the Deputy Chief of Staff for Personnel

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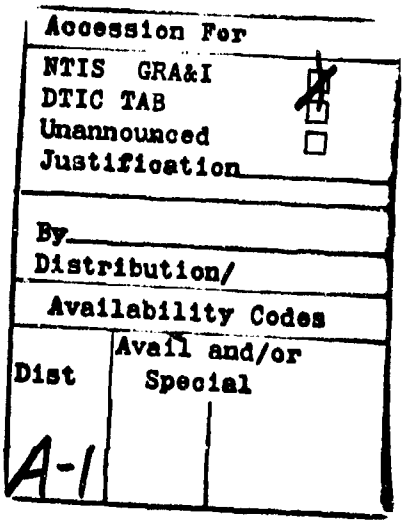

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UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS --
2a. SECURITY CLASSIFICATION AUTHORITY --	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE --	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) ARI Technical Report 831	5. MONITORING ORGANIZATION REPORT NUMBER(S) --
6a. NAME OF PERFORMING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences 6b. OFFICE SYMBOL (If applicable) PERI-RG	7a. NAME OF MONITORING ORGANIZATION --
6c. ADDRESS (City, State, and ZIP Code) 5001 Eisenhower Avenue Alexandria, VA 22333-5600	7b. ADDRESS (City, State, and ZIP Code) --
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.: 63731A; PROJECT NO.: 792; TASK NO.: 212; WORK UNIT ACCESSION NO.: H1

11. TITLE (Include Security Classification)
The Determinants of Attrition from the Army Selected Reserves

12. PERSONAL AUTHOR(S)
Dale, Charles

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Interim	FROM 82/01 TO 87/06	1989, March	25

16. SUPPLEMENTARY NOTATION
--

Military

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Reserves, Bonuses, Attrition, Enlistment, Compensation, Reenlistment, (SDW)

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This paper addresses concerns expressed by the Sixth Quadrennial Review of Military Compensation about the relatively high attrition rates that characterize the reserves. Data from the 1982 New Recruit Survey were matched with data from the Defense Manpower Data Center, and an econometric analysis was done to determine the principal characteristics of soldiers who attrited from the reserves between 1982 and 1987. Some of the results support the conventional wisdom: higher quality soldiers had lower attrition rates than lower quality soldiers. Other results were more surprising: about one third of reservists in 1982 listed unemployment as a major reason for enlisting, and they had higher-than-average attrition rates. Soldiers who said they planned to leave the Army had above-average attrition rates, but soldiers who said that they planned to stay in the Army after their initial enlistment had the same attrition rates as soldiers who said that they simply didn't know their future plans. Keywords:

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL Charles Dale	22b. TELEPHONE (Include Area Code) (202) 274-5610
	22c. OFFICE SYMBOL PERI-RG

DD Form 1473, JUN 86 *Previous editions are obsolete.* SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

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March 1989

Army Project Number
2Q263731A792

Manpower and Personnel

FOREWORD

The Manpower and Personnel Policy Research Group of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) performs research in the economics of manpower, personnel, and training issues of particular significance to the U.S. Army. Questions about the reasons for the relatively high attrition rates that have characterized the reserves have generated continuing interest.

Every 4 years the President establishes a Quadrennial Review of Military Compensation (QRMC) to study important issues. The Sixth Quadrennial Review of Military Compensation (Sixth QRMC) placed special emphasis on reserve compensation. This report was prepared as part of the Program Task in Recruiting and Retention of the ARI Manpower and Personnel Laboratory, under the 17 July 1987 memorandum from the Staff Director of the Sixth QRMC to the Commander of the Army Research Institute. In February 1988 the results of the report were briefed to the Chief of the Army Reserve. This paper addresses the concerns of the Sixth QRMC about determining the characteristics of soldiers who leave the reserves. The results may be used by the Army to help develop recruiting programs that will attract soldiers who are both well qualified and likely to remain in the reserves.

EDGAR M. JOHNSON
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THE DETERMINANTS OF ATTRITION FROM THE ARMY SELECTED RESERVES

EXECUTIVE SUMMARY

Requirement:

The U.S. Army Research Institute conducts research on manpower, personnel, and training issues of particular significance and interest to the U.S. Army. The Sixth Quadrennial Review of Military Compensation (Sixth QRMC) placed special emphasis on reserve compensation issues. This paper addresses the concerns of the Sixth QRMC about determining the characteristics of soldiers who leave the reserves.

Procedure:

New Recruit Survey (NRS) data for Selected Reservists from 1982 was merged with data from the Reserve Components Common Personnel Data System (RCCPDS) maintained by the Defense Manpower Data Center (DMDC). The data of soldiers who left by mid-1987 were analyzed to determine the causes of attrition, measured by both individual characteristics and survey responses.

Findings:

Some of the results support the conventional wisdom: Higher quality, better educated soldiers had lower attrition rates than lower quality soldiers. Other results were more surprising: An amazing one third of all soldiers who enlisted in the reserves in 1982 listed unemployment as a major factor for enlisting, and they had higher-than-average attrition rates. That result supports the view of researchers who hypothesize that many soldiers join and remain in the reserves primarily for economic reasons.

Utilization of Findings:

There are several clear policy implications from this research: If the Army can attract high-quality enlistees, they will have relatively low attrition rates; enlistment bonuses clearly lower attrition rates for male Guardsmen; and, while soldiers who said that they intended to leave the Army at the end of their first enlistment term had higher-than-average attrition rates, the Army has been successful in retaining soldiers who are simply unsure of their future plans, because they leave at the same rate as "career-oriented" soldiers.

THE DETERMINANTS OF ATTRITION FROM THE ARMY SELECTED RESERVES

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THE DETERMINANTS OF ATTRITION FROM THE ARMY SELECTED RESERVES

The reserves have become an increasingly important part of the total Army (Enns, 1985), and the President's Sixth Quadrennial Review of Military Compensation placed special emphasis on reserve compensation issues. One of the major issues facing the Army is the very high attrition rates that have typically characterized the reserves, so it would be of great interest to the Army to know the causes of attrition and their relationship to economic incentives.

This paper examines the question of what the determinants of reserve attrition currently are. In particular, we use survey data to find correlations between characteristics of new recruits and their likelihood of attrition. Those results can be compared to and extend a Rand study of Reserve attrition, and may be used by the Army to determine the probability that certain types of recruits will complete their terms of enlistment.

Our results also cast light on the continuing debate about soldiers' motivations for joining the reserves. Grissmer, Doering, and Sacher (1982) concluded that membership in the reserves should be tested against the economic theory of moonlighting, wherein the extra income from reserve membership would be a significant determinant of enlistment and reenlistment rates. We also conclude here that income from bonuses does have a small effect on decreasing attrition rates for male reservists.

BACKGROUND

There has been little research on reserve enlistment and retention problems until relatively recently. The first comprehensive study of reserve compensation issues was begun at the direction of the President in 1976 (Department of Defense, 1978). None of that report's recommendations on increasing pay in the early years while simultaneously deemphasizing retirement payments were adopted. Rand subsequently analyzed the FY80 cohort of nonprior service enlistees in the Army National Guard and the Army Reserve (Grissmer and Kirby, 1985, 1988) to try to determine the important variables that determine attrition.

This research was undertaken to to determine the characteristics of soldiers who attrit from the reserves. We attempt to replicate some of the Grissmer and Kirby results in this paper and also extend their work by using data from the 1982 Department of the Army Survey of Personnel Entering the Army (hereafter called the 1982 New Recruit Survey (Original Form), or simply the 1982 NRS/OF). The 1982 NRS/OF (Elig, 1983), the first in a series undertaken at the direction of the Army's Deputy Chief of Staff for Personnel, had as one of its objectives to determine who was enlisting in the Army Reserves, and why. We use the NRS data to determine if survey responses can be used as predictors of reserve attrition.

Attrition data was obtained from the Defense Manpower Data Center (DMDC), which maintains the Reserve Components Common Personnel Data System

(RCCPDS). The NRS data was merged with the DMDC data to determine attrition between the 1982 survey and mid-1987.

There are numerous possible definitions of attrition. We consider two types. The simplest one (hereafter ATTRIT) considers whether or not a soldier is still a member of the same unit he was in when he took the 1982 NRS survey. In this definition, there is no distinction as to whether or not a soldier left because he became a civilian, transferred from the Reserve to the Guard or the reverse, became an officer, etc. A narrower and perhaps more useful definition of attrition (hereafter ATTRITCV) considers a soldier to have attrited only if he or she became a civilian or a member of the IRR. This second type of attrition is less desirable and therefore of more interest to the Army. Both types of attrition are analyzed in this paper.

METHOD

Following Grissmer and Kirby (1985), we will test the moonlighting hypothesis of reserve attrition. In particular, if soldiers attrit for the same behavioral reasons that civilians leave their part time jobs, then we may hypothesize that reserve attrition depends upon:

- o migration patterns
- o marital status changes
- o age
- o race and sex
- o education
- o mental category
- o age

To this list we can add, because of the availability of the NRS data:

- o employment status at enlistment
- o stated career intentions
- o receipt of enlistment bonuses or New GI Bill benefits
- o educational aspirations
- o grades made in school

We can expect there to be some interactions between the characteristics listed above. This makes it difficult to specify an econometric model properly. Nevertheless we will include terms in our regression equations for all of the above hypotheses, for several reasons. First, it will permit us to replicate some earlier work on reserve attrition. Reserve data is typically so difficult to obtain in a form usable for analysis that it is important for researchers to try to confirm results obtained by others. Second, reporting our complete results will enable other researchers to compare future modeling efforts with ours, recognizing that model specification problems may have affected some of our results.

The expected results are straightforward: if geographic mobility affects reserve attrition, than groups with relatively lower migration should have relatively lower attrition rates: blacks should have lower attrition than whites, males should have lower attrition than females, and older enlistees

should have lower attrition than younger enlistees. On the other hand, if changes in marital status are the primary cause of attrition, then males will still have lower attrition than females, and blacks will still have lower attrition than whites, but younger enlistees will have lower attrition than older enlistees. If education, mental category, and grades in school are predictors of overall performance or success in training, then higher quality soldiers will have lower attrition rates than lower quality soldiers. If receipt of bonuses or educational benefits is dependent upon successful completion of a tour of duty, then they should result in lower attrition rates. If enlistees state that they intend to stay in the Army, then they should have relatively low attrition rates.

The use of survey data to test the above hypotheses is relatively new to research on reserves. A major source of data for our research was the 1982 New Recruit Survey/Original Form. The 1982 NRS/OF was administered to nonprior service recruits processing through the seven U.S. Army Reception Stations during May and June 1982 (Elig, 1983). The surveys were self-administered on familiar optical scanning answer sheets. The sample population for the original survey form was 1683 nonprior service accessions into the Army Reserve, and 2752 accessions into the Army National Guard. New recruits were processed at all seven Reception Stations for two of the three survey weeks. (Two of the seven Reception Stations were omitted during one survey week because of a conflicting mobilization exercise).

The Original Form of the NRS questionnaires had four sections. The Background section asked about the soldiers individual and family history, and marital history. The Experience section asked about educational and labor force experience: types of schools attended, highest grade completed, number of employers, income before enlisting, etc. The Enlistment section asked about the characteristics and processes of enlistment: term of enlistment, whether a recipient of enlistment bonuses or the Army College Fund, whether initial contact with the Army was made through mail-in coupons, recruiter contact, etc. The Decisionmaking section asked reasons for enlisting, post-accession plans, etc. The completed forms were returned to the Army Research Institute for processing, and the data was merged with information from the Armed Forces Entrance Examination Station Reporting System, for comparison of that database with the NRS survey self-reports.

The NRS data files were merged by social security numbers with data from the Reserve Components Common Personnel Data System (RCCPDS) maintained by the Defense Manpower Data Center (DMDC). The DMDC files had data on attrition through June 1987. Records for 1638 of the original 1683 NRS Reserve respondents, and 2375 of the original 2752 NRS Guard questionnaires, were successfully matched with RCCPDS records. Over 85% of both Reservists and Guardsmen enlisted for six year terms in 1982, so most of the soldiers who left by mid-1987 were attritees, rather than those reached the end of their enlistment term. Crosstabs were run on the NRS questions against all attrition (ATTRIT) and against attrition only into civilian life or the IRR (ATTRITCV). The crosstab results were used to choose variables to be included in logistic regression equations to determine the attrition probabilities.

We estimated logistic regression equations with both total attrition (ATTRIT) and attrition to civilian life or the IRR (ATTRITCV) as the dependent variables. That is, ATTRIT = 1 if the soldier attrited, and = 0 otherwise. To get the probability of attrition of soldier Xi who has k characteristics we set Xik = 1 for a particular k, set all the other Xik equal to their mean values, multiplied the resulting Xik by their regression coefficients, and added the results to form the exponent in the formula for attrition probability:

$$P(Xi) = 1/(1 + \exp(-(B0 + B1*Xi1 + B2*Xi2 + \ldots + Bk*Xik))). \qquad (1)$$

The resulting probabilities are described in the next section.

RESULTS

Figures A-1 and A-2 in Appendix A show attrition rates for male and female Reservists and Guardsmen for the period 1982-1987. The differences in attrition rates between males and females was not statistically significant, although our relatively small sample sizes (312 female Reservists and 284 female Guardsmen, see Appendix Table A-1) mean that we cannot draw any definite conclusions about females.

Appendix Tables A-2 and A-3 show the attrition probabilities for the two types of attrition measured here: all losses, and losses to civilian life or the IRR. Both tables show whether there are statistically significant differences between the attrition rates of soldiers with the characteristics shown and those of a reference soldier, which here was chosen to be a nonblack, high school graduate, 18 to 20 years old, single, AFQT Category III. The tables are very similar, except that in Table A-2 for all losses marital status has a stronger effect on attrition rates. This is not surprising, because that definition of attrition (which is of lesser interest to the Army but is included here to facilitate comparisons with earlier research on reserves) includes transferring to different units, which can certainly occur with changes in marital status.

We were most interested in attrition to civilian life or the IRR, as shown in Table A-3. Nearly all of the variables that were not statistically significant were so far from being significant at any reasonable significance level that we are confident that the possibility of making a "Type 2" error, or accepting an incorrect null hypothesis, are very small. Also, Table A-3 has some very interesting results.

Family status status made no significant difference for most soldiers, except for unmarried parents. For most recruits family status is therefore not a good predictor of the probability of attrition.

Soldiers of both sexes in both the Guard and Reserve who responded that they planned to leave the Army after their initial enlistment all had higher than average attrition rates. The students who had low grades when last in

school also had higher attrition rates than average. None of those results were very surprising.

More surprising is that soldiers who said that they planned to stay in the Army after their initial enlistment, either for another term or until retirement, had attrition rates the same as soldiers who responded that they simply didn't know their future plans. Also, there were no significant differences in attrition rates between those who enlisted whether or not they wanted money for college, or among most of those with differing levels of educational aspirations.

One of the most interesting categories was the question on unemployment. About one-third of both sexes in both the Guard and Reserve answered "True" to the statement "I enlisted because I was unemployed and couldn't find a job." Not only was the number of "True" responses remarkably high, but those respondents had significantly higher attrition rates. Our results are consistent with the moonlighting hypothesis. When soldiers enlist primarily because they are in poor economic condition, the probability that they will attrit is much higher than average, possibly because they finally found a much higher paying job elsewhere.

Finally, enlistment bonuses were clearly correlated (.01 level of significance) with lower attrition rates only for male Guardsmen, and the results were not quite significant for male Reservists. However, a power analysis (see Kraemer and Thiemann, 1987) for the enlistment bonus results showed that our sample sizes for male Reservists and female Guardsmen and Reservists did not have .90 power at even the .05 level of significance, so we cannot draw any definite conclusions about enlistment bonuses and lower attrition rates for those three categories of soldiers. Previously, Dale (1987) analyzed the 1978 reenlistment bonus data, and concluded that reenlistment bonuses decreased attrition rates for the reserves. The present research indicates that enlistment bonuses are likely to have a more marginal effect on attrition rates for male reservists.

DISCUSSION

We have examined some of the common socioeconomic factors that might affect attrition, which we defined two ways: total attrition, and attrition to civilian life or the IRR. Our measure of total attrition was used so that we could compare those results with that same definition used earlier by Grissmer and Kirby (1985). Our corresponding regression coefficients are shown in Tables B-1 and C-1, and a summary comparison is shown in Table E-1. Both this report and Grissmer and Kirby concluded that higher quality soldiers have lower attrition rates than lower quality soldiers, and that for most recruits family status is not a good predictor of the probability of attrition. Grissmer and Kirby also concluded that females have higher attrition rates than males, as hypothesized earlier, but we did not have a large enough sample of females to draw any conclusions about them.

Of more interest to the Army is the measure of attrition to civilian life or the IRR, as shown in Table A-3. Those results include New Recruit Survey data which enabled us for the first time to use survey responses as

possible predictors of reserve attrition. As noted earlier, there are problems specifying econometric models with so many interrelated variables. However, Appendix Table D-1 shows that the simple correlation coefficients between three variables of interest -- bonuses, unemployment, and college money -- and several other variables showed few potential statistical problems except for the expected one of the close relationship between wanting a college degree and wanting money for college. Thus the statistical problems in the model may be minimal.

Some of our results support the conventional wisdom: in general, higher quality soldiers have lower attrition rates than lower quality soldiers. Other results were more surprising: an amazing one-third of reservists in 1982 listed unemployment as a major reason for enlisting, and they had higher than average attrition rates (Table A-3). That result supports the hypothesis that soldiers enlist and attrit primarily for economic reasons, as opposed to the Moskos hypothesis (1981, 1988) which asserts that soldiers join and remain in the military for noneconomic reasons, such as patriotism and unit cohesion.

Another surprising result is that, while soldiers who said that they intended to leave the Army after their first enlistment term had higher than average attrition rates, soldiers who said that they intended to stay in the Army attrited at the same rate as soldiers who said that they simply didn't know their future plans. Thus most recruits are probably more uncertain than they realize about what their career plans are, and the reasons that the Army has been relatively successful retaining those soldiers is a possible subject for future research.

Enlistment bonuses were correlated with lower attrition rates only for male Guardsmen, but a power analysis showed that it would take a much larger sample size to conclude that bonuses have no effect on the other categories of soldiers. Perhaps only an actual bonus test could sort out the exact effects of bonuses on reserve attrition.

Future research could also examine other cohorts to determine how robust our results are. As suggested by Grissmer and Kirby (1988) other cohorts could be used to test our results and to help untangle the effects of unemployment on attrition.

REFERENCES

Dale, Charles. (1987). The effects of bonuses on Army Reserve enlistments: An empirical Bayes approach (ARI Technical Report 761). Alexandria, VA: U.S. Army Research Institute. (AD A188 770)

Elig, Timothy W. (1983). The 1982 DA survey of personnel entering the Army: Background, user's manual, and codebook (ARI Working Paper PUTA 83-3). Alexandria, VA: U.S. Army Research Institute.

Enns, John H. (1985). Improving the Army Reserves. Washington, DC: Congressional Budget Office.

Grissmer, David W., Doering, Zahava D., & Sachar, Jane. (1982). The design, administration, and evaluation of the 1978 selected reserve reenlistment bonus test (Report R-2865-MRAL). Santa Monica, CA: Rand Corporation.

Grissmer, David W., & Kirby, Sheila N. (1985). Attrition of nonprior-service reservists in the Army National Guard and Army Reserve (Report R-3267-RA). Santa Monica, CA: Rand Corporation.

Grissmer, David W., & Kirby, Sheila N. (1988). Changing patterns of nonprior service attrition in the Army National Guard and the Army Reserve (Report R-3626-RA). Santa Monica, CA: Rand Corporation.

Kraemer, Helena C., & Thiemann, Sue. (1987). How many subjects? Statistical power analysis in research. Beverly Hills, CA: Sage Publications, Inc.

Moskos, Charles C., Jr. (1981). Institution versus occupation: Contrasting models of military organization. Washington, DC: Air Force Office of Scientific Research.

Moskos, Charles C., Jr. (1987). The sociology of Army Reserves: A preliminary analysis (ARI Research Note 87-28). Alexandria, VA: U.S. Army Research Institute. (AD A181 831)

U.S. Department of Defense. Office of the Assistant Secretary of Defense (Reserve Affairs). (1978). Reserve Component Compensation Study. Washington, DC.

APPENDIX A

RESERVE COMPONENT RESULTS--LOSSES TO CIVILIAN LIFE OR IRR

Table A-1

Sample Sizes Used In Regression Analyses

	Number Surveyed			
	Army Reserve		National Guard	
Variable	Male	Female	Male	Female
Black	243	122	321	86
High school nongraduate	444	36	645	69
Less than 18 yrs old	473	56	728	69
21 years or older	213	106	308	84
Single, with dependents	102	28	230	38
Married, no dependents	56	15	110	29
Married, with dependents	61	19	107	15
AFQT Category I	54	12	67	9
AFQT Category II	387	89	525	51
AFQT Category III	143	17	142	25
Black, H.S. nongraduate	39	9	98	17
Black, less than 18 yrs old	49	17	71	21
Black, 21 yrs or older	50	42	74	24
Plan to leave the Army	166	36	276	35
Plan to stay in the Army	495	140	664	102
Received an enlistment bonus	447	107	1053	101
Was unemployed	479 (36%)	84 (27%)	648 (31%)	90 (32%)
Wanted college money	678 (51%)	184 (59%)	1112 (53%)	170 (60%)
In school when enlisted	831	171	1403	141
Made high grades in school	441	167	629	117
Made low grades in school	485	49	840	75
Want a college degree	854	261	1146	195
Want a high school diploma/GED	237	23	633	54
Sample size n =	1325	312	2090	284

Data Source: Matched NRS/RCCPDS data (see text).

Table A-2.

Five-year Reserve Attrition Probabilities: All Losses, by Component, Sex, and Reservist Characteristic

Characteristic	Army Reserve Male	Army Reserve Female	National Guard Male	National Guard Female
Sample size	1325	312	2090	285
Average attrition probability	.72	.69	.43	.39
Race				
Nonblack	.72	.69	.43	.39
Black	.64	.57	.44	.51
Education				
High school graduate	.72	.69	.43	.39
High school nongraduate	.71	.74	.58*	.72*
Age				
Less than 18 years	.70	.64	.42	.50
18 to 20 years	.72	.69	.43	.39
21 years or older	.62*	.63	.40	.55
Family Status				
Single, no dependents	.72	.69	.43	.39
Single, with dependents	.32*	.31*	.17*	.31*
Married, no dependents	.73	.91*	.65*	.76*
Married, with dependents	.79*	.60	.55*	.74*
AFQT				
Category I	.62*	.55	.38*	.40
Category II	.71*	.66	.41*	.61
Category III	.72	.69	.43	.39
Category IV	.65	.67	.50	.69*
Interactions				
Black, H.S. nongraduate	.78	.35	.46	.51
Black, less than 18 yrs old	.65	.79	.50	.56*
Black, 21 yrs or older	.79	.66	.37	.28

Average attrition probability refers to soldiers with reference characteristics: Nonblack, high school graduate, 18 to 20 years old, single, Category III.

*Differs significantly from reference soldier at .05 level, two-tailed test.

Table A-3.

Five-year Reserve Attrition Probabilities: Losses to Civilian Life or IRR By Component, Sex, and Reservist Characteristic

	Army Reserve		Nati Guard	
Characteristic	Male	Female	Male	e
Sample Size n =	1325	312	2090	284
Average attrition probability	.29	.23	.28	.34
Race				
Nonblack	.29	.23	.28	.34
Black	.28	.33	.23	.33
Education				
High school graduate	.29	.23	.28	.34
High school nongraduate	.32	.47	.38*	.60*
Age				
Less than 18 years	.29	.40	.23*	.38
18 to 20 years	.29	.23	.28	.34
21 years or older	.27	.37	.27	.44
Family Status				
Single, no dependents	.29	.23	.28	.34
Single, with dependents	.09*	.09*	.09*	.18*
Married, no dependents	.26	.56*	.32	.50
Married, with dependents	.37	.44	.27	.59*
AFQT				
Category I	.33	.30	.22	.1?
Category II	.30	.30	.24	.[illegible]
Category III	.29	.23	.28	.34
Category IV	.31	.18	.29	.51
Interactions				
Black, H.S. nongraduate	.33	.05*	.35	.48
Black, less than 18 yr old	.25	.36	.36	.31
Black, 21 yr or older	.45*	.32	.22	.21
Survey responses:				
Plans after this enlistment				
Leave the Army	.37*	.35*	.35*	.50*
Stay in the Army	.29	.36	.25	.40
Don't Know	.29	.23	.28	.34

Table A-3 (Continued).

Five-year Reserve Attrition Probabilities: Losses to Civilian Life or IRR By Component, Sex, and Reservist Characteristic

	Army Reserve		National Guard	
Characteristic	Male	Female	Male	Female
Received Enlistment Bonus				
Yes	.26	.22	.24*	.33
No	.29	.23	.28	.34
Reasons for Enlisting				
Was unemployed				
True	.32*	.50*	.31*	.50*
False	.29	.23	.28	.34
Wanted college money				
True	.29	.42*	.24*	.32
False	.29	.23	.28	.34
Grades made in school				
High grades	.28	.42*	.27	.29
Average grades	.29	.23	.28	.34
Low grades	.32*	.51*	.30*	.22
Educational Aspirations				
College degree	.32	.33	.27	.34
H.S. diploma/GED	.37*	.18	.28	.23
None of the above	.29	.23	.28	.34

Average attrition probability refers to soldiers with reference characteristics (see Table A-2).

*Differs significantly from reference soldier at .05 level, two-tailed test.

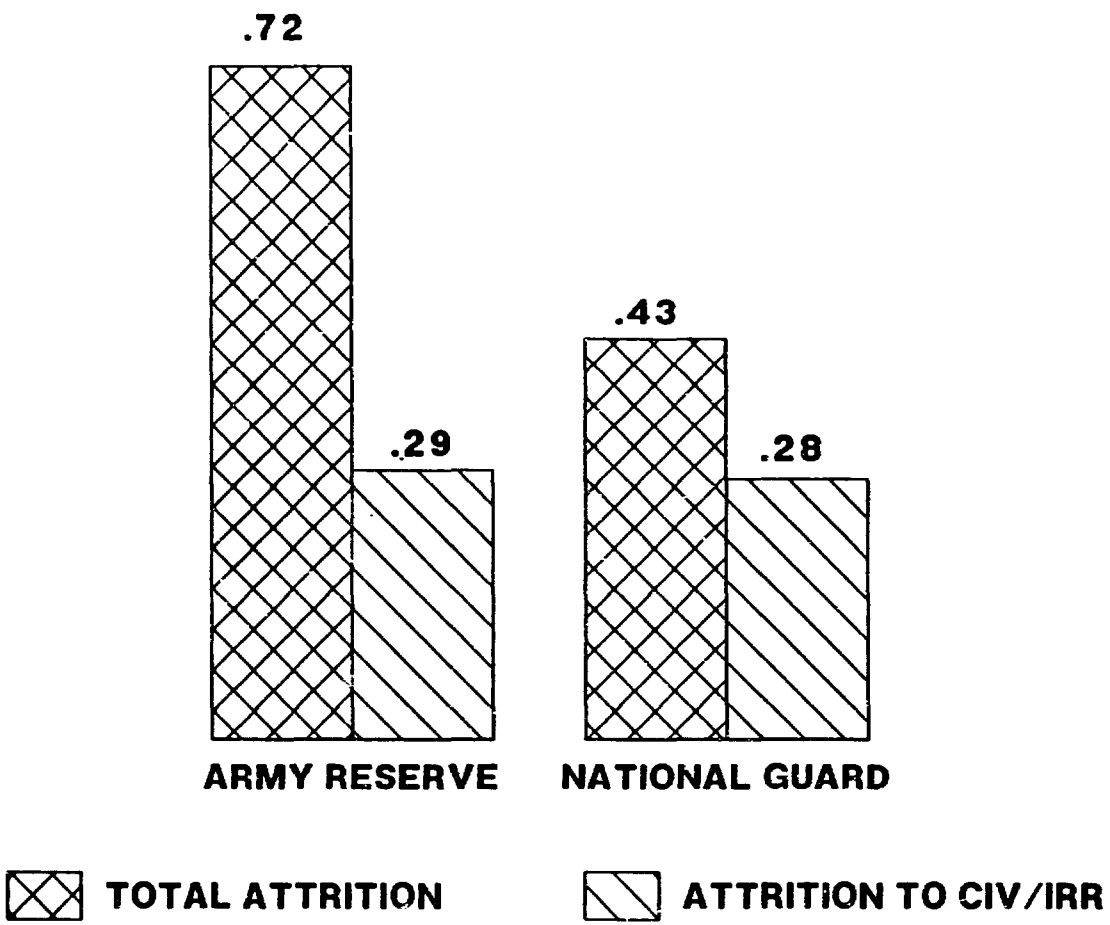

Figure A-1. Attrition rates as of 1987 for NPS males who enlisted in 1982.

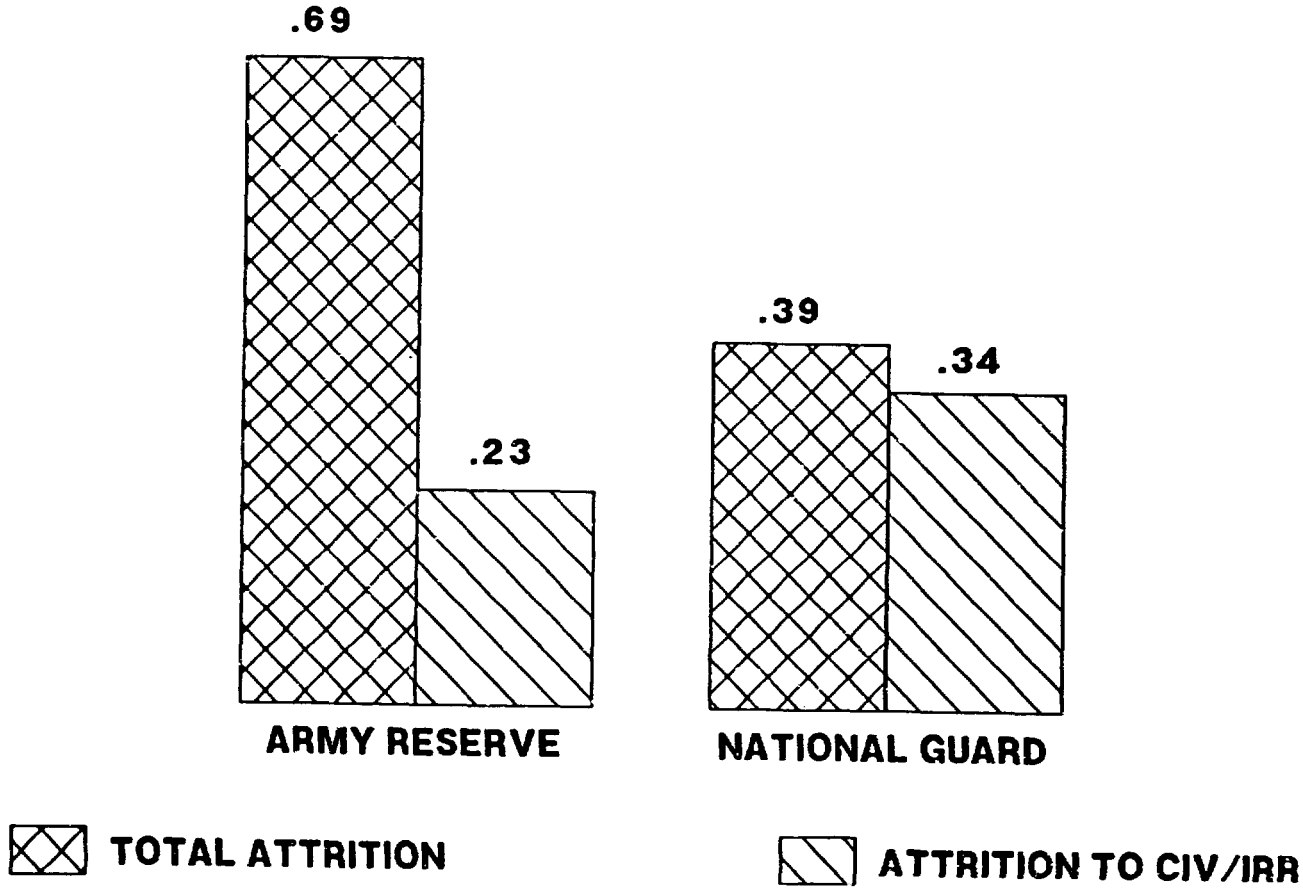

Figure A-2. Attrition rates as of 1987 for NPS females who enlisted in 1982.

APPENDIX B

ARMY RESERVE RESULTS—ALL LOSSES

Table B-1

Regression Coefficients For Army Reserve Five-Year Attrition Model: All Losses, By Sex

	Dependent Variable: [illegible]tion			
	Male		Female	
Independent Variable	Coef.	Std. Error	Coef.	Std.Error
Constant	.94	.13	.80	.29
Black	-.23	.22	-.52	.37
High school nongraduate	.17	.16	.51	.53
Less than 18 years old	.14	.16	-.01	.45
21 years or older	-.36	.20*	-.08	.38
Single, with dependents	-1.64	.24*	-1.52	.45*
Married, no dependents	.23	.32	1.76	.84*
Married, with dependents	.58	.32*	-.20	.52
AFQT Category I	-.30	.31	-.41	.64
AFQT Category II	-.31	.14*	.11	.29
AFQT Category IV	-.19	.21	.12	.58
Black, H.S. nongraduate	.52	.47	-1.25	.99
Black, less than 18 yrs old	-.76	.41	.77	.81
Black, 21 yrs or older	.57	.41	.07	.57

* Significant at .05 level

APPENDIX C

NATIONAL GUARD RESULTS--ALL LOSSES

Table C-1

Regression Coefficients For National Guard Five-Year Attrition Model: All Losses, By Sex

	Dependent Variable: Attrition			
	Male		Female	
Independent Variable	Coef.	Std.Error	Coef.	Std.Error
Constant	-.29	.09	-.47	.28
Black	.03	.19	-.02	.44
High school nongraduate	.79	.11*	1.23	.39*
Less than 18 yrs old	-.14	.11	-.04	.40
21 years or older	-.17	.17	.25	.37
Single, with dependents	-1.53	.20*	-.97	.44*
Married, no dependents	.91	.21*	1.21	.47*
Married, with dependents	.46	.22*	1.07	.64*
AFQT Category I	-.26	.26	-.44	.75
AFQT Category II	-.14	.11	.49	.34
AFQT Category IV	.25	.19	.84	.49*
Black, H.S. nongraduate	.11	.28	.00	.78
Black, less than 18 yrs old	.26	.32	.22	.73
Black, 21 yrs or older	-.31	.34	-1.06	.71

*Significant at .05 level.

APPENDIX D

SELECTED CORRELATION COEFFICIENTS

Table D-1

Selected Correlation Coefficients
Variables Used In The Logistic Regression Equation
Dependent Variable: Attrition To Civilian Life Or IRR

	Received Enlistment Bonus	Was Unemployed	Wanted College Money
Male Reservists:			
AFQT Category II	.12	-.17	.16
In school when enlisted	.23	-.22	.29
Made high grades	.11	-.16	.15
Want a college degree	.12	-.21	.40
Female Reservists:			
AFQT Category II	.04	-.05	.01
In school when enlisted	.09	-.16	.26
Made high grades	-.02	-.12	.05
Want a college degree	.05	-.14	.35
Male Guardsmen:			
AFQT Category II	.12	-.08	.18
In school when enlisted	.19	-.17	.19
Made high grades	.06	-.12	.17
Want a college degree	.14	-.19	.45
Female Guardsmen:			
AFQT Category II	.09	-.12	.14
In school when enlisted	.04	-.24	.20
Made high grades	.08	-.09	.15
Want a college degree	.14	-.23	.44

APPENDIX E

REPLICATION COMPARISONS

Table E-1

Summary Comparison
Replication of Rand Long-Term Attrition Study

Characteristic	RAND	ARI
Time Period	1980-82	1982-87
Army Reserve:		
Males		
Sample Size	16,845	1,325
Average attrition probability	.29	.72
Females		
Sample Size	8,061	312
Average attrition probability	.48	.69
Army National Guard:		
Males		
Sample Size	44,170	2,090
Average attrition probability	.23	.43
Females		
Sample Size	4,651	284
Average attrition probability	.50	.39

Note. Average attrition probabilities refer to soldiers with reference characteristics (see Table A-2).