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ABSTRACT

Because the first-term attrition rate for enlisted Marine Corps women is nearly 50 percent, or about twice that for comparable men, a study was undertaken to identify factors that might be related to this high attrition rate. During the study, the following three data sets were analyzed: historical master files and recruit accession management system files, a three-year follow-up on a recruit-training attrition study of 196 women that used expectations to predict attrition, and a job satisfaction survey administered to 1,369 Marine Corps women. While the results of the study indicated that most of the difference in post-recruit training attrition between men and women was due to pregnancy, the data did not support the hypothesis that women are becoming pregnant in order to be discharged. Because factors associated with Marine Corps experience, particularly in the work setting, appeared to be related to attrition, recommendations were made calling for additional investigation of these experience factors. Other recommendations emerging from the study included training in sex education and life-decision making, placement of women in units with at least one other woman, and use of information on women's interests in sports and nontraditional activities when recruiting. (Author/MN)

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FIRST-TERM ATTRITION AMONG MARINE CORPS WOMEN: SOME ASSOCIATED FACTORS

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The first-term attrition rate for enlisted Marine Corps women is nearly 50 percent, about twice that for comparable men. To identify factors that might be related to attrition, three data sets were analyzed. They included historical master files and recruit accession management system files, a 3-year follow-up on a recruit-training attrition study using expectations to predict attrition, and a job-satisfaction survey. Results indicated that most of the difference in post-recruit training attrition between men and women was due to pregnancy. Background variables were of limited usefulness in

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predicting attrition Factors associated with Marine Corps experience, particularly in the work setting, appeared to be related to attrition. The data did not support the hypothesis that women are becoming pregnant in order to be discharged. Further investigation of these experience factors is recommended, in addition to investigation of training in sex education and life-decision making. Placement of women in units with at least one other woman and use of information on women's interests in sports and nontraditional activities in recruiting are also recommended.

FOREWORD

This research was conducted within project CF521-080 USMC Personnel Resources Management, under work unit number 101-04.23 (Assessment of First-term Attrition of Women Marines). Its purpose is to identify factors related to the attrition of Marine Corps women and to develop recommendations to address the problem. The research effort is being conducted in three phases. The first phase, which is described in this report, involved examination of existing data to identify problem areas. The second phase will more specifically examine the problem factors by comparing experiences within the work setting of attrites and nonattrites. The third phase will attempt to present a counter-attrition program.

The assistance of Dr. Stuart Youngblood and Dr. Robert Baker, of the University of South Carolina, and Dr. Bert King of the Office of Naval Research (ONR) in providing access to data on Marine Corps women recruits collected under ONR contract N000-14-76-C-0938 is gratefully acknowledged. In addition, the assistance of Captain Lisa Talmage of HQMC (TPI) in providing access to data on job satisfaction among Marine Corps women and of Major Dan Kuhn and Major Michael Patrow of HQMC (MPI-20), project officers for the research, are gratefully acknowledged.

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SUMMARY

Problem

The attrition rate for first-term enlisted women in the U.S. Marine Corps (USMC) is nearly 50 percent, which is nearly twice that of first-term enlisted men who are high school graduates, a comparable group. If women are to continue to contribute meaningfully to meeting the Marine Corps' personnel requirements, their attrition rate must be reduced.

Objective

The objective of this study was to seek the causes of attrition among women Marines by reviewing previous research and analyzing existing data sets.

Method

Three data sets were analyzed:

1. Historical master file and recruit accessions management file records containing biographical and Marine Corps experience information for all women entering the Marine Corps in FY77 through FY80 and for an equal number of Marine Corps men who are high school graduates.

2. Results of a survey of attitudes, expectations, and career goals of two companies of Marine Corps women recruits collected in August 1977 and February 1978 as part of a study of attrition during recruit training conducted by the University of South Carolina for the Office of Naval Research. Historical master file information also was obtained for these women 3 years later.

3. Responses to a survey of job satisfaction among Marine Corps women conducted in 1980 by the USMC Office of Manpower Utilization. The survey data contained 77 standard items measuring the woman's satisfaction with many aspects of the job and the work setting, as well as an item measuring "thinking of quitting," which was used as a surrogate criterion for attrition behavior.

Five criterion groups were specified, including recruit training attrites, pregnancy attrites, other post-recruit attrites, nonattrites who were mothers, and all nonattrites. Background and Marine Corps experience variables were compared and statistical tests were applied to identify significant differences. Additionally, multiple regression analyses were performed to determine the additive effects of the several types of variables on attrition behavior.

Findings

1. Although some biographical variables are related to attrition, the correlations are generally too small to be useful.

   a. Women who fail to complete recruit training enter the Marine Corps with somewhat less interest in male-oriented activities, and lower expectations of completing recruit training, than do the women who complete recruit training.

   b. Women who attrite after recruit training for reasons other than pregnancy tend to have higher expectations for Marine Corps life and a greater interest in male-oriented activities than do nonattrites.

c. Women who attrite due to pregnancy do not differ significantly from non-attrites in background variables.

2. Situational variables are strongly related to attrition after recruit training.

a. Women who are less satisfied with their jobs, working relationships, and future opportunities in the Marine Corps are more likely to think of quitting than those who are more satisfied.

b. The attrition rate for women who have no other women in their units is twice that for first-term women in general.

3. The primary difference between rates of post-recruit training attrition for female and male high school graduates is due to pregnancy attrition.

a. Pregnancy rates for Marine Corps women are comparable to those of other women their age.

b. Women who attrite due to pregnancy are more likely to be married than nonattrites, but otherwise differ little from them.

c. Pregnant women who choose to remain in the Marine Corps are more likely to be black, married or divorced, and in a clerical job, than those who leave.

Conclusions

1. The most important predictors of attrition for enlisted women appear to be variables related to Marine Corps experiences, such as occupational field or satisfaction with supervisor, rather than background variables, such as age or mental test scores. Before specific counter-attrition proposals can be made, more specific information is needed about those aspects of Marine Corps experiences that are related to attrition.

2. Although pregnancy accounts for the majority of the difference in attrition between men and women, results do not support the hypothesis that many women are becoming pregnant in order to be discharged. If many of these pregnancies are unplanned, a sex education program that includes life-decision making has the potential for reducing attrition due to pregnancy.

Recommendations

1. The effects on attrition of specific Marine Corps experiences, particularly of experiences in the work situation, should be examined.

2. The motivations of women Marines who become pregnant and the feasibility of decreasing pregnancy by conducting sex education and life-decision making training should be explored.

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Problem

The attrition rate for U.S. Marine Corps (USMC) women in their first enlistment is nearly 50 percent, which is nearly twice that of first-enlistment USMC male high school graduates, a comparable group. If women are to contribute meaningfully to the Marine Corps' personnel requirements, their attrition rate must be reduced.

Objective

The objective of this study was to seek the causes of attrition among Marine Corps women by reviewing previous research and analyzing existing data sets.

Background

During the last decade, in response to both a declining manpower supply and societal pressures toward equality, the military services greatly expanded their utilization of women. Women entered the services in the greatest numbers since World War II, and also entered many job specialities that had not been open to them before. In the Marine Corps, the number of women more than doubled, with women entering 96 percent of all military occupational specialties (MOSs). Women are prohibited from filling combat positions, and this increase occurred in spite of the fact that the USMC has the highest ratio of combat to noncombat positions of any military service. Unfortunately, this increased accession of women has been accompanied by an unacceptably high attrition rate.

The problem of reducing attrition has long been of interest to researchers and policy makers in both military and civilian communities (Goodstadt & Yedlin, 1979; Hand, Griffith, & Mobley, 1977; Sinaiko & Marshall, 1980; Wiskoff, Atwater, & Houle, 1980). Many research studies have identified aptitude and background variables that are related to attrition, including age at entry, educational level, mental level (as measured by the Armed Forces Qualification Test), and number of dependents. These variables have been used to develop screening devices to eliminate people with a high likelihood of not completing their enlistments. Such screening devices explain, at best, only 10 to 20 percent of the variance (Hand et al., 1977). Additionally, attitudes and expectations about military service have been used to predict who is likely to leave, accounting for about 8 percent of the variance (Hand et al., 1977).

Other researchers have emphasized contextual rather than individual variables in predicting attrition. Attrition during recruit training, for example, has been found to differ by platoon and drill instructor (Novaco, Sarason, Cook, Robinson, & Cunningham, 1979; Mullin, 1977), while later attrition differs by unit organizational variables, which account for a maximum of about 20 percent of the variance (Hand et al., 1977; Nogami, 1981; Wiskoff et al., 1980). In general, the reviews concluded that, although many variables are related to attrition, the percentage of variance explained by any one variable is small, and multivariate approaches are critically needed to understand and decrease attrition.

Few research studies have included women in the populations under examination, because until recently women constituted such a small part of the enlisted force. The factors influencing attrition among women may be very different from those affecting men, for several reasons. First, military service is an unusual experience for women, but

a common one for men. Therefore, the personality types of women who join may be different from those of men. Although research (Office of the Assistant Secretary of Defense (OASD), 1981, p. 65; Thomas, 1977) has suggested that women and men enlist for about the same reasons, their expectations may be met differentially, and they may not leave for the same reasons.

Second, military service may be particularly stressful for women. Because women constitute a small minority of any military service, they are subject to the many stresses of being "tokens," as described by Kantor (1977). Also, many women in the military work in blue-collar occupations, an unfamiliar and possibly stressful career field for them.

Finally, probably the most important reason why attrition among men and women may differ is that ways to obtain an early release differ for men and women. For men, most attrition occurs at the instigation of the military authority, because of misconduct, fraudulent enlistment, unsuitability for military service, physical or mental difficulties, or other reasons. All of these reasons, except Pseudofolliculitus-Barbae, a facial hair and skin condition, apply to women as well as to men, and attrition rates for these reasons are generally similar for men and women (OASD, 1981, p. 46). In addition, a woman who becomes pregnant is given the choice of remaining in the service or being given an honorable discharge. (This choice, however, has recently been curtailed to reflect the needs of the service.) When men have been given an opportunity to terminate their enlistments voluntarily (Guthrie, Lakota, & Matlock, 1978), they, too, have had high attrition. Without such a choice option for men, however, men who attrite have failed in some way, while women who attrite may be satisfactory performers.

A few studies have examined attrition specifically among women. Several of these attempted to predict attrition of women from aptitude and background variables. In a U.S. Army study, Eaton and Nogami (1981) found that education, mental level, and race were related to attrition, with blacks and those with higher test scores and high school diplomas less likely to leave before the end of their enlistments. Thomas (1980), however, found that higher mental level was predictive of attrition among Navy women. In a study of U.S. Navy enlisted women (Wilcove, Thomas, & Blankenship, 1979), items measuring mental health, occupational needs, motivations for enlisting, and social activities were used to predict attrition after 18 months. Use of the most predictive items produced an estimated cross-validation correlation of about .30. Nevo (1976) developed a 13-item biographical inventory to predict military success (although not attrition, per se) among Israeli Army women. Items dealing with parental employment and high school experiences were somewhat useful, with a cross-validation coefficient of .18, about half that for men. These studies indicate that background and interest variables are useful in predicting attrition for military women but, as with men, the amount of variance explained is not large.

Other studies have examined women's expectations about military life and their attitudes toward military careers at enlistment. Keenan (1976) found that British Army women who survived the first 6 weeks of basic training had begun with more positive attitudes toward an Army career than had those who attrited. Hammond (1977), in a replication, found no relationship between expectations and attrition.

Mobley, Youngblood, Meglino, and Moore (1980), in one of the few studies of Marine Corps women, found that those who failed to complete recruit training had, at the start of training, lower intentions to complete their enlistments and were relatively less attracted to Marine Corps careers than were those who did complete recruit training.

Two studies examined the ways in which experience in various military MOSs affected attrition. Eaton and Nogami (1981) classified Army MOSs as traditional, less traditional, or nontraditional for women, and compared attrition rates for MOSs in the three categories. Although attrition was highest in the nontraditional category, rates for individual MOSs varied widely within each category. A study of women's attrition in the Army and Air Force (OASD, 1981, pp. 47-50) concluded similarly that, although attrition was lower in traditional, administrative career fields than in nontraditional fields, not all nontraditional fields had high attrition. Results from these studies suggest that, although the concept of traditionality explains some of the differences in attrition rates among MOSs, other MOS- and job-related factors influence attrition as well.

In a longitudinal study of 1,000 enlisted Navy women, Thomas (1980) found that different factors were associated with different types of attrition. Women who left during recruit training could be described as having inadequate or passive-dependent personalities. Women who left due to pregnancy (41% of all female enlisted Navy attriters) cited problems in combining motherhood and a military career as reasons for leaving. Women being discharged for reasons other than pregnancy were more likely to report being misled by their recruiters or being dissatisfied with their job specialty or other aspects of Navy life, complaints similar to those of enlisted men in the Navy.

Little formal research has been performed on the attrition of women from blue-collar job training and apprenticeship programs. In general, age, educational level, and vocational training have been associated with training completion (Briggs, 1978; CONSAD, 1976), while other factors, such as availability of child care or transportation and support from family and friends, have been associated with continuation in nontraditional job fields (Kane, Dee, & Miller, 1977).

Because pregnancy is one of the major reasons for attrition among women, variables that predict pregnancy may be useful in predicting attrition. Unfortunately, according to Weist and Squier (1974, p. 243), "no personality traits or behavioral dispositions have been found that singly or in combination correlate significantly with differences in reproduction or contraception" (see also Gough, 1976). Variables such as education and social class are predictive of group differences in both desired and actual family size (Chilman, 1973). For individual women, however, the best predictors of pregnancy are those associated with (1) opportunity, which is influenced by factors such as marital status and age at marriage, and (2) the likelihood of using contraception, which is influenced by factors such as access to family planning services, employment status, and communication with partner.

Adler (1981) described a constellation of traits and situational factors that appear to make unplanned pregnancies more likely. Women who become pregnant accidentally often have weak feelings of self-competence and control, a conflict over their own sexuality, a desire to demonstrate their adulthood, and a lack of career goals. In addition, they have often had recent exposure to stressful events. Finally, the attitudes of their peers and health care providers about the types of sexual and contraceptive behaviors that are appropriate for them also influence their sexual activity and contraceptive use. Marine Corps women, who have experienced the stresses of recruit training and major life changes, who may have entered the Marine Corps because their career goals were not clear, and whose presence in the Corps is challenged by men, may be particularly vulnerable.

For women as well as for men, research indicates that expectations, background and ability factors, and contextual factors on the job are all related to attrition; however, the contribution of any one of these factors is small, and the combined effect of several

factors is unknown. For women, background factors, such as age, education, and mental level, appear to explain a smaller proportion of the variance than they do for men, probably because of restricted ranges in the women's distributions of scores on these variables. For women, family considerations appear to play a larger part in attrition, both because pregnancy provides an opportunity to receive an early, honorable discharge, and because the problems of combining military and family responsibilities may be greater for women than for men.

This research review suggests that if attrition among women Marines is similar to other enlisted attrition, the following relationships can be expected:

1. Background variables, such as age, race, mental level, and level of education will predict attrition, but the relationships will not be large because of restriction in range and the effects of other variables.

2. Expectations and attitudes about Marine Corps life, collected early in recruit training, will predict attrition.

3. Organizational and situational characteristics, such as MOS and job satisfaction, will predict attrition, and the relationship will be greater for women than for men because attrition for women has a larger voluntary component.

4. Attrition due to pregnancy will be predicted less accurately than will attrition for other reasons.

METHOD

Data Sources

Several data bases were used to obtain an accurate description of attrition among Marine Corps enlisted women and to identify variables that predict attrition. Although each data base was limited either in the variables it included or in size, the use of several sources of data provided the potential for replication of results from any one source. The data sources were historical records, a recruit follow-up survey, and a job satisfaction survey.

Historical Records

Official personnel records for all Marine Corps enlisted men and women contain two data files that are particularly useful in studying attrition, the Historical Master File (HMF) and the Recruit Accessions Management Systems file (RAMS). The HMF contains current information on MOS, duty station, education, rank, marital status, race, number of dependents, mental level and aptitude scores, Marine Corps enlistment dates, and similar variables. For persons who have been discharged, the HMF also reports the date and type of discharge. The RAMS file contains information on recruit platoon and drill instructor, hobbies, preenlistment interest in sports, job history, and initial MOS assigned. A data set was extracted from the HMF and RAMS files containing a record for each woman who entered the Marine Corps between October 1976 and September 1980. To provide a comparison group for these women, who must be high school graduates or equivalent, an equal number of male high school graduates who had entered the Marine Corps during the same period was extracted. The elimination of reservists resulted in a sample containing 6,912 women and 5,891 men.

Recruit Follow-up Survey

As part of the study of recruit training attrition, Mobley and his associates (Mobley et al., 1980) administered a survey to two companies of Marine Corps women recruits at the start (August 1977) and at the completion (February 1978) of their recruit training. The survey contained a large number of items that required the respondents to describe what they expected the Marine Corps and civilian job life to be like, as well as questions about career goals and motivations. In 1981, portions of the HMF record, including information on attrition, were added to the survey data. This data set was obtained from Mobley and his colleagues so that the relationship between predictor variables and post-recruit training attrition could be examined. Data were available for 196 women.

Job Satisfaction Survey

A standard job satisfaction survey has been developed as a part of the Marine Corps Task Analysis Program for enlisted MOSs. This survey, which consists of 77 standard items based on Hackman and Oldham's (1975) Job Diagnosis Survey, measures the characteristics of the job, the individual's need for growth, and the individual's satisfaction with the working conditions, interpersonal relations, the work itself, and the organization as a whole. In 1980, this job satisfaction survey was administered by the Office of Manpower Utilization (MPU) to 1,369 Marine Corps women (1,271 enlisted and 98 officers). The resulting data were obtained from MPU for further analysis. Although women from a range of MOSs were included, sampling was not random. Instead, surveys were administered at locations in which a large number of women were concentrated. In addition, surveys were completed anonymously, making later identification of attriters impossible. The survey contained a single career-intent item that asked how frequently the respondent thought of quitting. This item was used as a surrogate criterion for the ultimate attrition/retention behavior.

In addition to structured questions, the survey contained an opportunity for respondents to add comments about their jobs or their Marine Corps experiences. Many women did comment, and these responses were content-analyzed by pay grade and MOS.

Variable Selection and Definition

Criteria

Five attrition/nonattrition categories were developed from data in the historical records:

1. Recruit training attrition (RA), which included those who failed to complete recruit training due to any of a number of reasons, including unsuitability, recruit failure, erroneous enlistment, and medical or physical problems.

2. Pregnancy attrition (PA), which included all women discharged due to pregnancy.

3. Other attrition (OA), which included all post-recruit training attrition other than pregnancy. The major portion of other attrition was due to either unsuitability or behavior problems, including misconduct, desertion, or drug use.

4. Nonattrition (NA), which included all women without children and all men who were either still on active duty in their first enlistments or who had successfully completed their enlistments and were discharged or reenlisted.

5. Marine Corps mothers (MM), which included all women who, when they became pregnant, chose to remain in the Marine Corps.

This categorization separated the major types of attrition without creating an unwieldy number of small groups.

Predictors

Each data set contained a large number of variables that, according to the literature, could be used to predict attrition. Those selected for inclusion in the analyses are listed in Table 1.

Several of these variables were created for this study from information available in the data sets. For example, the geographic region and urban metropolitan background variables were created by recoding the home-of-record zip code.

The recruit follow-up data set contained a series of questions about the desirability of 50 specific job outcomes, such as "working with people I like" and a "job that pays well," as well as questions about the likelihood of achieving each of these in the Marine Corps or a civilian job. Mobley and his associates (Mobley et al., 1980) multiplied each item's desirability by the expectation of achieving it, and summed the result to obtain estimates of both military and civilian role attractiveness. They then multiplied these measures by the expectations of remaining in the Marine Corps or finding a suitable civilian job to obtain role forces for each of the two possibilities. These measures, in addition to other composite measures, such as organizational commitment, were included as predictors. In addition, changes in expectations during recruit training were calculated by subtracting values at the beginning of training from those at the end.

Several variables were selected or constructed to measure the men's and women's interests or experiences with particular aspects of Marine Corps life. The height/weight ratio, an estimate of physical fitness at entrance, was calculated because physical fitness is an important part of Marine Corps life. A sports-participation variable, another measure of interest in physical fitness, was created for each individual by computing a weighted sum of sports listed in the person's RAMS record, with greater weight given to team sports, such as soccer, than to individual sports, such as swimming.

Another variable was created to identify women who had experience in mostly male groups or jobs that are usually considered nontraditional for women. This was calculated by adding to the sports participation variable points for playing a band or orchestral musical instrument, having hobbies more typical of men than women, such as hunting and fishing, and having job experience in fields more typical of men, such as truck driving.

Unit identification information (the reporting unit code) was used to classify units according to type of assignment (Fleet Marine Force-Ground, Fleet Marine Force-Air, Base-Ground, Base-Air, and Other), as well as determine the approximate number of women in the unit.

Analyses

Three types of data analysis were performed. First, to determine the attrition rates of women and men for various causes, simple cross-tabulations were made of the historical records. In addition, a computer program that calculated survival rates (Hull & Nie, 1981, pp. 205-219) was applied to track attrition over time. To determine whether the underlying pregnancy rate for Marine Corps women was higher than that for other

Table 1

Potential Predictors of Attrition

Variable	Source of Data: Historical Records (HMF/RAMS)	Recruit Follow-up Survey	Job Satisfaction Survey
Background			
Age	x	x	
Race	x	x	
Geographic region	x	x	
Urban metropolitan	x	x	
Mental level	x	x	
ASVAB raw and composite scores	x	x	
Height/weight ratio	x	x	
Highest math course	x	x	
Years of education	x	x	
Sports participation	x	x	
Interests	x	x	
Need for growth in job			x
Expectations			
Expectations about Marine Corps		x	
Expectations about civilian life		x	
Likelihood of attriting		x	
Recruit Training			
Platoon	x	x	
Drill instructor	x	x	
Change in expectations		x	
Post-recruit Training			
MOS	x	x	x
Number of women in unit	x		
Unit type and location	x		x
Harassment experience			x
Job satisfaction			x
Co-worker satisfaction			x
Supervisor satisfaction			x
Marine Corps satisfaction			x
Family Status			
Marital status	x	x	x
Number of children	x		x

women their age, pregnancy rates per year were estimated by adding the number of women with one or more children, prorated by year, to the number of pregnancy discharges in that year.

Second, relationships between the attrition/nonattrition categories and the variables listed in Table 1 were investigated. To do this, chi-square or F tests were performed, as appropriate, between the attrition/nonattrition categories and variables of interest for both men and women. For some variables, such as unit type and location, MOS, and number of women at a command, attrition rates for the various categories were compared. Product-moment correlations were calculated between "thinking of quitting" and both individual items in the job satisfaction survey and composite scores derived from these items as described in Hackman and Oldham (1975).

Finally, hierarchical multiple-regression analyses were performed to determine the additive effects of the several types of variables on attrition. For the historical data, each type of attrition was predicted separately for men and women when appropriate. In addition, pregnancy attrites were compared with Marine Corps mothers who did not attrite.

Because of the small sample size in the recruit follow-up data set, Marine Corps mothers were not separated from other nonattrites in that regression analysis. For the job satisfaction survey, "thinking of quitting" was predicted, rather than attrition.

To cross-validate regression results, the data sets were divided into two random samples, with about 60 percent in the development sample and 40 percent in the cross-validation sample. Hierarchical multiple regressions were performed on the development sample, with categorical variables coded and entered as described in Cohen and Cohen (1975, pp. 173-188).

Information on recruit training platoon and drill instructor was included in the regression analyses for women only by selecting women who had been trained by the seven drill instructors with the most trainees. Binary variables were created for both platoon and drill instructor and entered into the regressions as sets.

MOS information was included in several ways. MOSs were categorized in four groups corresponding to three of the four ASVAB interest groups, administrative, electronic, and mechanical, with a fourth category for MOSs not included in these three. The fourth ASVAB interest category, combat, was not used because women are not permitted to work in combat-related fields. A separate variable was created to identify aviation MOSs. Another variable indicated whether the MOS assigned was in the same category as the person's highest interest score, and a final variable indicated whether the person was working in the MOS field assigned after recruit training.

For the regression analyses, the following a priori ordering procedure was used: Fiscal year cohort, geographic region, race, other background and interest variables, MOS category, other Marine Corps experience variables, and, finally, marital status. Stepwise selection was used within each category.

Resulting regression weights were applied to the cases in the cross-validation sample to calculate a predicted attrition score. The predicted scores were correlated with actual

attrition status to determine the cross-validation correlation. For the job satisfaction survey data, the regression analysis was repeated on the cross-validation sample, and results compared.

RESULTS

Attrition Rates

The magnitude of the attrition problem among Marine Corps women is illustrated by Table 2, which presents attrition rates by sex, service, and educational level for the cohort entering the services in fiscal year 1977 (OASD, 1981 p. 46). The Marine Corps women included under non-high school graduates have received a graduation equivalency diploma (GED) and represent only 2.3 percent of all women in FY77, as compared to 31.0 percent of all men. Not only is attrition among Marine Corps women the highest among any women of any service, but the difference in attrition between men and women is higher than in any of the other services.

Table 2

Three-year Attrition by Sex and Education

	High-school Graduates (%)		Non-high-school Graduates (%)		Total Attrition (%)	
Service	Male	Female	Male	Female	Male	Female
Army	24.8	40.3	47.3	55.4	34.4	42.1
Navy	22.5	28.6	45.6	48.6	28.6	29.9
Marine Corps	23.5	48.0	41.0	53.9[a]	28.8	48.4
Air Force	24.3	30.7	48.5	47.9	26.1	32.2
Department of Defense	23.9	35.8	46.2	53.4	30.8	37.4

[a]For Marine Corps women, this category includes only those receiving equivalency diplomas and represents only 2.3 percent of the population.

Within the Marine Corps, reasons for leaving differ for women and men. Table 3 displays the percentages of women and men high school graduates in several attrition/non-attrition categories. In addition to high pregnancy discharge rates, women have higher discharge rates than do men during recruit training, and women's attrition due to unsuitability is slightly higher than men's. Men's attrition is slightly higher for "other" reasons. Reenlistment rates for men and women, however, are quite similar.

Table 3

First-term Enlistment Outcomes for High School Graduates Enlisting in the Marine Corps in FY77 and FY78

Attrition/Nonattrition Category	Percentage in Category			
	Men		Women	
	FY77	FY78	FY77	FY78
Attrition	25.9	21.9	45.3	44.3
Recruit training	9.9	7.9	17.4	10.7
Other attrition				
Unsuitability	2.6	2.0	3.2	3.4
Behavior/drugs	5.3	3.4	3.7	2.9
Medical/physical	3.3	3.1	2.0	2.8
Pregnancy	—	—	16.6	21.3
Other	4.8	5.5	2.4	3.2
Nonattrition	74.1	78.1	54.7	55.7
End of active service/ early release	20.4	2.3	14.2	2.7
Reenlistment	10.6	2.3	10.8	5.0
Still in first enlistment	43.1	73.5	29.7	48.0

Note. Ns ranged from 1285 to 1887.

Figure 1 displays the percentages of women and men remaining in the Marine Corps at 3-month intervals. It includes all the men and women in the historical data set, not just those entering in FY77 and FY78. The dotted line displays what the attrition rates would be for women if all those who were discharged due to pregnancy had been retained. Figure 1 illustrates, again, that the largest portion of the difference in attrition between men and women is due to pregnancy. Most of the remainder of the difference isaccounted for by factors present during recruit training; after the first 3 months, the top two lines are remarkably parallel.

Figure 2 indicates when different types of attrition among women occur. Almost all of the erroneous enlistments are identified during recruit training, as are most of the women discharged for unsuitability. Most pregnancy discharges occur by the end of the second year, while women are discharged for behavior problems, such as drug use, throughout their enlistments.

Because pregnancy accounts for such a large proportion of attrition among Marine Corps women, one important question is whether they are becoming pregnant in greater numbers than are other women their age. A higher than average pregnancy rate would suggest that some of these women may be becoming pregnant in order to leave the Marine

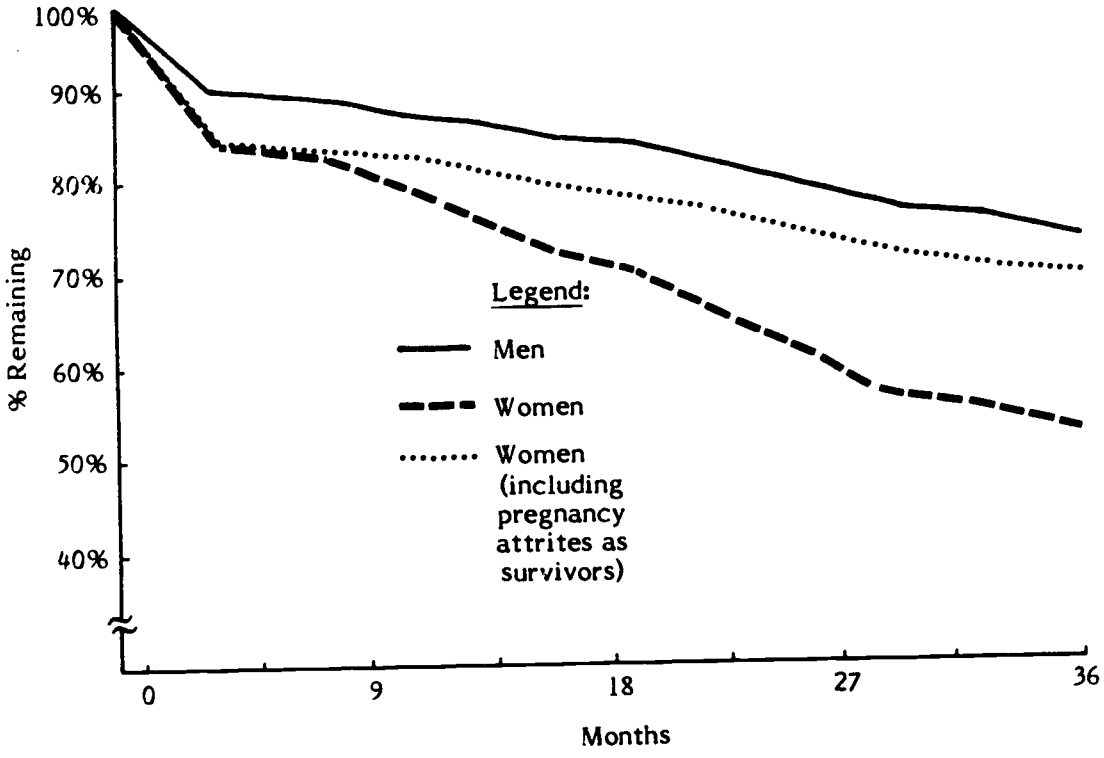

Figure 1. Survival rates for women and men high school graduates in the Marine Corps.

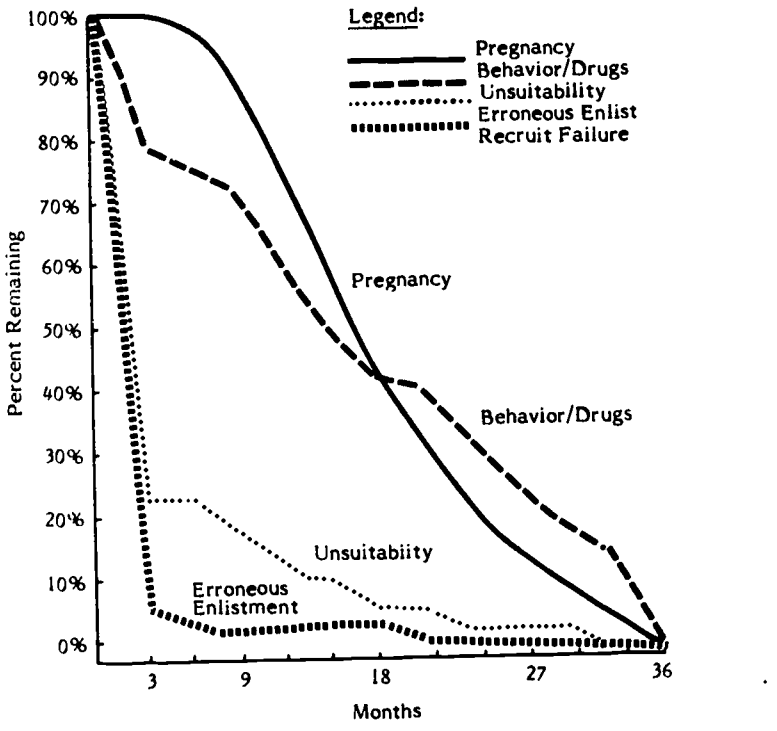

Figure 2. Time of attrition by attrition type.

Corps before completing their enlistments. The rate of pregnancy discharges for Marine Corps women entering in the FY77 cohort of 17 percent was higher than the 13 percent rate for all service women. These data reflect only discharges, however, and do not include women who remain in the service when pregnant. Interservice differences in formal or informal policies on retaining women when pregnant could cause differences in pregnancy attrition rates, given the same pregnancy rates.

Accurate annual pregnancy rates for military women are not available (OASD, 1981, p. 78). However, Table 4, which compares the pregnancy rates of Marine Corps women with those of other women, shows that these rates, even assuming all the pregnancies are carried to term, are not higher than those for other women their age. Higher pregnancy attrition, therefore, appears to represent higher attrition, given pregnancy, rather than higher rates of pregnancy.

Table 4

Estimated Annual Birth or Pregnancy Rates for American Women of Childbearing Age

Group	Percentage
All American Women (aged 15-44)[a]	6.7
White American women	6.3
Black American women	8.9
All American Women (aged 20-24)[a]	11.2
Other Service Women[b]	
Navy women	7.4
Air Force women	9.0
Army women	10.0
Marine Corps Women in First Enlistment[c]	10.0
First year	7.8
Second year	15.5
Third year	10.4
Fourth year	6.1

[a]Birth rates from Statistical Abstract of the U.S. 1980 (101st Edition) published by the U.S. Bureau of the Census, 1980.

[b]Pregnancy rates from Background Review: Women in the Military, published by the Office of the Assistant Secretary of Defense, October 1981. (p. 78)

[c]Pregnancy rates calculated for the FY77 and FY78 cohorts from the number of pregnancy discharges plus the number of women with one or more children.

Background Variables

Table 5 presents differences in background variables by attrition/nonattrition category for women and for men high school graduates who entered the Marine Corps in FY77 or FY78. Several variables were significantly related to attrition, but differences generally were not large enough to be useful in a practical application. For both sexes, those who were older at entry and those with a poorer mathematics background were more likely to attrite. Lower AFQT was related to attrition for men, but not for women. Although all the men in this data set were high school graduates, the AFQT level for men was still significantly lower than that for women. The restricted range in women's AFQT scores may have been responsible for the lack of relationship. Black men were more likely to attrite than were white men, while black women were more likely to remain in the Marine Corps than were white women.

Attrites and nonattrites differed in their interests, as well. Among men, recruit attrites had significantly lower scores on all four interest-inventory scales, were less involved in typically male activities, and were in poorer physical condition than other attrites and nonattrites. The other attrites had significantly lower scores on the combat-interest scale than did nonattrites. For women, recruit attrites had low scores on most interest scales, on sports, and on typically male activities, while other attrites and Marine Corps mothers had high scores on these measures. Pregnancy attrites scored highest on the administrative interest scale, but about the same as the nonattrites on most other measures.

Table 6 displays the results of using these individual variables together with information on MOS to predict several attrition/nonattrition categories using multiple regression analysis. Specific results for each regression analysis, along with regression weights, are presented in Tables A-1 to A-6 in the appendix. For most attrition categories, the results were unimpressive. Because the criterion of attrition/nonattrition is dichotomous, the multiple R and cross-validation r are actually point-biserial, rather than product-moment correlations. For point-biserial correlations, the maximum possible r decreases as the ratio of the two criterion groups departs from 1:1. Even when the maximum possible values are considered (see the Maximum Possible r column in Table 6), the use of several background items as predictors produced only small, though significant, correlations.

Different variables were useful in predicting different types of attrition. For women, low combat interest, little team experience, a weak high school mathematics background, and being white predicted recruit attrition. For men, low combat interest, low AFQT score, little team experience, poor physical condition as measured by height/weight ratio, and being a recent high school graduate contributed significantly to prediction of recruit attrition, although the contribution was not large. Being older and unmarried predicted other attrition for both men and women. Being white or having a poor mathematics background predicted other attrition for women. Being black or having a low AFQT predicted other attrition for men. The only variable that was useful in predicting pregnancy attrition was marital status.

Although background variables were of relatively little use in predicting most kinds of attrition, they were more useful in predicting whether a pregnant Marine Corps woman would remain in the service or request a discharge. Pregnant women who decided to stay in the Marine Corps were more likely to be divorced, black, older, or in a clerical job than women who decided to leave.

Table 5

Background Variables and Type of Attrition for Women and Men Enlisting in the Marine Corps in FY77 and FY78

Variable	Attrition/Nonattrition Category					F-Test
	RA	PA	OA	NA	MM	
Women						
Number of Cases	326	552	351	1,434	169	
Age at Enlistment	19.98	19.79	20.10	19.89	20.41	3.21*
AFQT	71.87	72.04	72.58	72.92	73.29	1.07
High School Math	2.13	2.30	2.20	2.36	2.26	3.68**
Race (%)						
White	82	82	85	76	69	8.29***
Black	16	14	10	19	26	7.74***
Other	2	4	5	5	5	.97
Region (%)						
New England	7	8	9	8	5	.63
Mid Atlantic	21	20	18	26	27	3.73**
South	25	24	23	18	31	5.47***
Midwest	38	36	36	37	23	3.57**
Mountain	7	10	9	9	11	.65
Pacific	1	2	5	2	3	2.46*
Interests						
Mechanical	7.66	7.68	8.55	7.54	7.99	3.48**
Administrative	12.06	12.78	12.44	12.53	13.20	4.69***
Electronic	5.99	6.72	7.10	6.75	7.11	3.77**
Combat	15.31	16.48	17.15	16.49	16.21	10.57***
Team Sports	.62	.61	.69	.67	.78	1.34
Male Interests	1.66	1.48	1.78	1.77	1.96	2.21
Height/weight Ratio	51.69	51.90	50.98	51.62	51.41	1.92
Men (High School Graduates)						
Number of Cases	216	--	402	2,139	--	
Age of Enlistment	19.76	--	19.36	19.08	--	25.24***
AFQT	49.71	--	51.65	56.49	--	22.79***
High School Math	1.79	--	1.79	1.98	--	8.35***
Race (%)						
White	67	--	59	69	--	8.22***
Black	28	--	35	24	--	10.99***
Other	5	--	6	7	--	.64
Region (%)						
New England	7	--	6	8	--	.61
Mid Atlantic	29	--	25	26	--	.62
South	21	--	20	21	--	.15
Midwest	35	--	39	35	--	1.12
Mountain	6	--	8	9	--	1.43
Pacific	1	--	1	1	--	.68
Interests						
Mechanical	11.02	--	12.11	12.08	--	4.71**
Administrative	8.80	--	10.13	10.01	--	14.64***
Electronic	6.77	--	8.27	8.01	--	8.72***
Combat	15.37	--	16.87	17.84	--	43.02***
Team Sports	0.46	--	0.53	0.56	--	1.60
Male Interests	1.44	--	1.68	1.83	--	3.30*
Height/weight Ratio	43.90	--	45.25	45.51	--	7.48***

*p ≤ .05.
**p ≤ .01.
***p ≤ .001.

Legend.
RA = Recruit training attrites.
PA = Pregnancy attrites.
OA = Other attrites after recruit training, except for pregnancy.
NA = Nonattrites.
MM = Marine Corps mothers.

Table 6

Prediction of Attrition Using Variables from the Historical Data Set

Attrition/ Nonattrition[a] Category	Sex	Percent Attrite	Maximum Possible r	Developmental N	Developmental R	Cross-validation N	Cross-validation r
Recruit Training Attrite/Nonattrite	Men	9	.50	2,868	.21***	2,436	.15***
	Women	14	.63	3,272	.18***	2,763	.12***
Other Attrite/Non-attrite	Men	16	.64	1,469	.19**	1,141	.17***
	Women	18	.66	1,128	.28***	844	.17***
Pregnancy Attrite/ Nonattrite	Women	25	.72	1,247	.19*	1,016	.15***
Pregnancy Attrite/ Marine Corps Mothers Nonattrite	Women	75	.72	414	.44***	331	.29***

[a]For recruit training attrition, nonattrites were those who successfully completed recruit training. For other attrition types, nonattrites were those who had completed at least 2 years of their enlistment.

*$p \leq .05$.
**$p \leq .01$.
***$p \leq .001$.

Table 7 presents, by marital status and race, the percentages of women in the total historical data base who became pregnant during their Marine Corps career, and, of those, the percentages who remained in the Marine Corps. Marital status represented the current status on the historical master file, not necessarily that at the time of pregnancy. Married and divorced women were significantly more likely to have been pregnant than single women, but single women were most likely to attrite when pregnant. Among single women, whites were less likely to become pregnant than blacks, but more likely to attrite when pregnant. Among married women, pregnancy rates did not vary by race, but white women were again more likely to leave when pregnant. Divorced black women were significantly more likely to have been pregnant but any conclusions are not justified because of the small numbers. These results agree with those of Hoiberg and Ernst (1980), who found that married women and black women were significantly more likely to remain in the Navy when pregnant.

Table 7

Differences by Marital Status and Race in Pregnancy Rates and Attrition Rates when Pregnant for all Black and White Women in the FY77-FY80 Cohorts

Marine Women	Current Marital Status[a]					
	Single		Married		Divorced	
	White	Black	White	Black	White	Black
Total	3,459	1,220	1,461	265	150	5
Number pregnant	344	160	459	86	37	4
Percent pregnant	9.9	13.1	31.4	32.5	24.7	80.0
Percent attriting when pregnant	87.8	56.9	77.6	55.8	24.3	0.0

Results of Partitioning Chi Square

	Chi Square	
	For Incidence of Pregnancy	For Incidence of Attrition when Pregnant
Marital status	404.98***	61.79***
Race within marital status		
Single	6.54*	54.17***
Married	0.17	17.78***
Divorced	10.69**	1.11
(with Yates correction)	(7.07**)	(0.11)
Overall	422.38***	134.85***

[a]Current marital status as recorded on the historical master file, not necessarily at the time of pregnancy.

*$p \leq .05$.
**$p \leq .01$.
***$p \leq .001$.

Although AFQT scores have been useful in predicting attrition among men, they were not found to be useful among women, given women's restricted range of scores. Other aptitude scores, given as part of the ASVAB, also were not particularly useful either when examined individually or when combined in 10 composite scores. When post-recruit training attrition was examined, only three of the 12 subtests, General Information, Electronics Information, and Shop Information, had means that were significantly different for attrites and nonattrites (see Table A-7). Of the composite scores, only the Mechanical Maintenance composite had significantly different means between the groups. In each case, the later, nonpregnancy attrites had the highest mean scores, while the pregnancy attrites and nonattrites had very similar scores.

Because these subtests were developed to predict success in particular job fields, attrites might be expected to score less well than nonattrites within particular job fields. When results were examined for all 12 subtests and 30 composites by 12 job fields, differences were significant in only 17 instances (see Table A-7), about the number that would be expected by chance. Differences were significant for interest scales in a additional five instances.

Expectations

Differences between expectations about Marine Corps life and organizational commitment of attrites and nonattrites are displayed in Table 8. Where significant differences occured, the recruit attrites differed from the other three groups, which did not differ significantly among themselves. No significant differences were found between the attrition/nonattrition categories in their expectations of completing their service or in the desirability of various outcomes from work, such as learning new skills, financial benefits, or family separation. Pregnancy attrites began with less commitment to the Marine Corps and more attraction to a civilian job than did nonattrites and other attrites, but the differences were generally not significant.

Marine Corps Experiences

Recruit Training

Changes in expectations, and differences between expected and actual satisfaction after recruit training, were significantly different for different attrition/nonattrition categories, although, again, the largest differences were between recruit attrites and all others (see Table 9). When used in a regression equation to predict post-recruit training attrition, individual change scores did not contribute significantly.

Platoon and drill instructors appeared to have a substantial effect on changes in expectations about Marine Corps life. Table 10 displays the mean changes in several expectation and satisfaction variables for each of the four platoons in the recruit follow-up sample. The women who failed to complete recruit training were excluded from this sample, so the differences do not reflect different numbers of attriters. They may reflect different drill instructor practices or recruit company climates.

When information on drill instructors and recruit training platoons was added to background data in a regression equation to predict different types of attrition, drill instructor information accounted for about 1 percent of the variance and platoon accounted for about another 3 percent. These increases were not significant, however.

Number of Women in the Unit

Table 11 displays the percentages of women attriting by number of women in the unit, as designated by reporting unit code. Because these rates are not annual, they cannot be compared with attrition rates by year or cohort. Attrition rates for units with only one woman were about twice those for units with 10 or more women. The correlation between number of women in the unit and attrition was -.14, significant at the .01 level (N = 418), although not large. These results suggest that the inverse relationship between the number of women in a group and attrition is not linear, but is strongest in units with few women.

Table 3

Expectations of Women Recruits About Marine Corps Life

Expectations	Mean Scores at the Start of Recruit Training				Significance Level
	RA	OA	PA	NA	F
Intentions					
To complete	3.87 (23)	4.49[a] (43)	4.47[a] (34)	4.62[a] (85)	3.45**
To reenlist	2.57 (23)	3.04 (43)	3.09 (34)	3.21 (85)	3.04*
To try to get out	2.16[b] (18)	1.71[a,b] (40)	1.65[a,b] (30)	1.39[a] (71)	4.84**
Organizational commitment	50.04 (23)	57.05[a] (38)	54.90[a] (29)	56.29[a] (68)	4.46**
Expectations					
Chances of completing	.84 (18)	.89 (40)	.88 (30)	.88 (71)	.37
Chances of finding civilian job	.54 (18)	.49 (40)	.56 (30)	.47 (71)	.97
Chances of getting out	2.40[b,d] (23)	1.49[a,c] (43)	1.95[b,d] (34)	1.50[a,c] (85)	6.86***
Role Attraction, Force					
Marine role attraction	31.92 (23)	33.87 (39)	39.65 (29)	40.11 (68)	2.01
Civilian role attraction	20.81 (23)	20.08 (39)	25.28 (29)	20.57 (68)	1.28
Marine role force	29.82 (14)	33.53 (29)	34.64 (22)	39.17 (47)	1.31
Civilian role force	11.50 (14)	7.51 (29)	13.28 (22)	8.75 (47)	2.44
Difference: role force	18.32 (14)	26.02 (29)	21.37 (22)	30.42 (47)	2.29
Difference: role attraction	12.81 (14)	16.99 (29)	12.82 (22)	21.59 (47)	2.38
Other					
My values are similar to organization's	3.09 (23)	3.66 (43)	3.32 (34)	3.58 (85)	2.67*
Very glad I joined	3.07[b] (23)	4.07[a,b] (43)	3.82[a,b] (34)	4.20[a] (85)	6.47***

Note. Numbers in parentheses refer to number in each group.

[a]This group mean differs significantly from that of the recruit training attrite group.

[b]This group mean differs significantly from that of the nonattrite group.

[c]This group mean differs significantly from that of the pregnant attrite group.

[d]This group mean differs significantly from that of the other attrite group.

*p < .05.
**p < .01.
***p <.001.

Legend.
RA = Recruit training attrites.
OA = Other attrites.
PA = Pregnancy attrites.
NA = Nonattrites.

Table 9

Changes in Expectation and Satisfaction During Recruit Training by Attrition/Nonattrition Category

Variable	Attrition Outcome				F-test
	RA	OA	PA	NA	
Role Attraction					
Marine	-7.71	8.74[a]	3.36[a]	3.87[a]	3.31*
Civilian	1.79	5.36	3.43	3.08	.42
Difference					
Role force	-23.95	5.95[a]	3.85[a]	2.06[a]	10.81***
Role attraction	-9.50[b,d]	3.39[a,c]	-.07[b,d]	.79[a,c]	3.03*
Satisfaction					
Overall	-.53[b]	.01[a,b]	.14[a,b]	-.03[a]	3.68*
Leader	-.60	.09[a]	-.07[a]	.07[a]	5.51***
Growth	-.47	.03	-.03	-.02	3.18*
Sample Size[e]	23	39	29	68	

[a]This group mean differs significantly from that of the recruit training attrite group.

[b]This group mean differs significantly from that of the nonattrite group.

[c]This group mean differs significantly from that of the other attrite group.

[d]This group mean differs significantly from that of the other attrite group.

[e]Individual sample sizes were sometimes slightly smaller due to missing data.

Attrition/Nonattrition Category.

RA = Recruit training attrition.
OA = Other attrition after recruit training.
PA = Pregnancy attrition.
NA = Nonattrition.

*p < .05.
***p < .001.

Table 10

Changes in Expectations About USMC Life During Recruit Training, by Platoon

Variable	Mean Change by Platoon 1	2	3	4	F-test
Role Attraction					
Marine	6.80[a]	9.88[a]	-4.26[b]	-.07[b]	3.75*
Civilian	1.77	7.62	-2.53	6.01	4.85**
Difference					
Role force	5.50	1.71	-5.59	-3.70	1.62
Role attrition	5.16	2.26	1.73	6.08	3.17*
Satisfaction					
Overall	.15	-.13	-.05	-.23	1.62
Leader	.32	-.24	-.09	-.22	4.67**
Growth	.10	-.26	.03	-.21	2.54
Number in platoon[c]	38	39	35	40	

[a]This platoon's mean differed significantly from those of Platoons 3 and 4.

[b]This platoon's mean differed significantly from those of Platoons 1 and 2.

[c]Sample sizes for individual tests were sometimes slightly lower due to missing data.

*p < .05.
**p < .01.

Table 11

Differences in Attrition Rates by Number of Women in Unit

Number of Women in Unit	Percent Attrition Pregnancy	Later	Total	Number of Units
1	31	16	47	94
2-3	15	17	32	73
4-5	23	13	36	48
6-7	12	6	18	28
8-9	18	12	30	21
10-15	15	8	23	48
More than 15	14	9	23	106

Type of Unit

Differences in pregnancy and later attrition rates were not significant when compared across type of unit (Fleet Marine Force (FMF)-Ground, Fleet Marine Force-Air, Base-Ground, Base-Air, and Other) and geographic location (East Coast, Mid-Continental U.S., West Coast, Eastern Pacific, and Other).

Occupational Field

Table 12 presents post-recruit training attrition rates for women and for men high school graduates for the most populous occupational fields. Total attrition rates for women are considerably higher than for men, with medians of 37 percent and 14 percent respectively, although nonpregnancy attrition for women is very similar to attrition for men, with a median of 13 percent. In addition, the occupational fields with high and low attrition are very similar for men and women. When the occupational fields were rank-ordered by attrition, correlations between the rank-orderings for men and women were as shown below.

Correlations between rank-orderings of occupational fields	Correlation Coefficients
1. Correlation between total attrition of men and of women.	.66 ($p \leq .005$)
2. Correlation between total attrition of men and pregnancy attrition of women.	.30 ($p \leq .25$)
3. Correlation between total attrition of men and non-pregnancy attrition of women.	.51 ($p \leq .025$)

This similarity appears to extend across military services, as well. When Army MOSs were equated with USMC occupational fields, women's attrition rates correlated .54 ($p < .025$) for nonpregnancy attrition and .79 ($p < .005$) for total attrition. Such results suggest that factors related either to the work itself or to the type of recruits assigned to these fields may have consistent effects on attrition.

As Eaton and Nogami (1981) concluded from Army data, the relationship between traditionality of the field for women and attrition does not appear to be clearcut. Although many nontraditional fields have high attrition, some nontraditional fields, such as Aviation Operations, have a low attrition rate (26%), while traditional ones, such as Supply, have a higher rate (41%). Traditionality may be confounded with desirability of the field in general (for example, Food Service has high attrition), as well as with the percentage of women in the field, and the likelihood that the women in this sample were the only ones, or the first ones in their work groups. The correlations between percentage of women in the field and women's nonpregnancy attrition of .51 ($p \leq .025$) and total attrition of .66 ($p < .005$) suggest that being one of the few women in the field does affect attrition.

Table 12

Post-recruit Attrition Rates by Occupational Field for Women and Men High School Graduates Enlisting in FY77 and FY78

Occupational Field	Attrition of Women(%) Total	PA	OA	"Other" Attrition of Men (%)	Sample Size Women	Men	% of Field that are Women
Traditional Clerical							
Personnel and Admin. (01)	35	23	12	15	713	149	15
Supply (30)	41	26	16	17	278	67	7
Finance (34)	32	18	14	25	100	12[a]	14
Legal Services (44)	31	19	12	--[a]	65	--	22
Less Traditional							
Food Service (33)	45	28	17	20	163	71	8
Data Systems (40)	29	20	9	6	85	16	11
Photography (46)	32	20	12	--	60	--	11
Military Police (58)	43	32	11	9	72	56	4
Electronics/Communications							
Operational Comm. (25)	41	25	16	14	184	234	4
Signals Intelligence (26)	39	32	7	4	56	27	6
Telecomm. Maint. (28)	32	20	12	12	65	41	5
Avionics (63/64/65)	35	19	16	6	122	121	3
Mechanical and Field							
Utilities (11)	48	21	27	8	67	51	5
Engineering (13)	52	26	26	19	46	145	1
Ordnance (21)	54	35	19	24	26	51	2
Motor Transport (35)	47	29	18	18	158	253	3
Aircraft Maint. (60/61)	34	24	10	14	93	213	2
Aviation Operations (70)	26	19	7	3	43	34	3
Combat Arms							
Infantry (03)	--	--	--	24	--	490	--
Field Artillery (08)	--	--	--	15	--	107	--
Tank and Amphib. Tractor (18)	--	--	--	24	--	66	--
Range	26-54	18-35	7-27	6-25			
Median	37	24	13	14			

[a]Sample size less than 5.

Legend.

PA = Pregnancy attrition.
OA = Other attrition after recruit training.

When variables representing MOS group (clerical, electronic, mechanical, and other), a MOS compatible with interests, working outside of one's MOS, and an aviation MOS were added to the regression analyses (see Tables A-3 through A-6), their contributions to prediction were small. The only significant contribution was for the match between MOS and interests for the women nonpregnancy attriters.

Job Satisfaction

In the job satisfaction survey, most individual satisfaction variables were significantly related to thinking of quitting, although the magnitude of the relationship was not always large. Table 13 displays the correlations between thinking of quitting and various satisfaction and job description measures, and a measure of growth-need strength for enlisted women with different lengths of service. Job description measures and growth-need strength were least related to thinking of quitting, while measures of satisfaction with peer and supervisor interactions and with opportunities for growth and achievement in the Marine Corps were most related.

Satisfaction with the immediate job and with its setting were more highly related to thinking of quitting than satisfaction with the Marine Corps in general (r's of -.57 and -.28 respectively for enlisted women in pay grades 1 to 4), a finding opposite that for Navy men and women (Royle [illegible]ertson, 1980). The difference between what enlisted women wanted in a job and what they received, that is, their unmet expectations, correlated -.36 ($p < .001$) with thinking of quitting for those in pay grades 1 to 4. These work group-level relationships explain much more of the variance in the criterion measure than did any of the background variables included in the regression equations.

The stronger relationships may have been due to the continuous criterion of thinking of quitting rather than the dichotomous attrite/nonattrite criterion, however. When the background variables were included in a regression with organizational-level and work group-level variables to predict thinking of quitting (Table A-8), the work group-level variables still were the most potent predictors. Even when other variables were controlled, work level variables, such as the motivating potential of the job, the harassment received on the job, and, especially, the women's satisfaction with the job explained nearly 30 percent of the variance. These results were essentially replicated in both halves of the data set.

Analysis of the written comments on the job satisfaction surveys highlighted several problem areas for women. The most frequent problems mentioned were verbal harassment or lack of respect for women, followed by dissatisfaction with MOS assignment or lack of training.

Table 13

Correlations Between Job Satisfaction Factors and "Thinking of Quitting"

Measures	Group: Pay Grades E-1 thru E-4 (N=1008)	Group: Enlisted With 2 Years or Less Service (N=858)	Group: Enlisted With 6 Years or More Service (N=187)
Satisfaction Measures			
General satisfaction	-.60***	-.61***	-.58***
Overall satisfaction with job	-.57***	-.58***	-.62***
Overall satisfaction with Marine Corps	-.28***	-.28***	-.23***
Supervisors	-.44***	-.45***	-.46***
Interpersonal relations	-.42***	-.42***	-.43***
Working conditions	-.24***	-.24***	-.17*
Salary	-.22***	-.22***	-.15*
Security	-.41***	-.43***	-.36***
Achievement	-.50***	-.50***	-.53***
Growth	-.56***	-.57***	-.55***
Job Description Measures			
Skill variety	-.31***	-.33***	-.40***
Task identity	-.15***	-.16***	-.19*
Task significance	-.20***	-.19***	-.32***
Autonomy	-.32***	-.35***	-.44***
Feedback from job	-.33***	-.33***	-.36***
Motivation potential summary score	-.39***	-.42***	-.45***
Sexual harassment on the job	-.13***	-.14***	-.22**
Sexual harassment off the job	-.03	-.05	-.04
Person Description Measures			
Growth-need strength (Readiness for change)	-.09**	-.12**	-.06
Unmet expectations	-.36***	-.38***	-.44***

*p < .05.
**p < .01.
***p < .001.

DISCUSSION

In general, the results of this study supported the findings of previous research. As expected, contributions of background variables to predicting attrition were significant though small. Expectations about Marine Corps life collected at the start of recruit training did predict attrition, but only attrition during recruit training. Some organizational and situational characteristics, such as job satisfaction, did predict post-recruit

training attrition, but others, such as type of organization, did not. Also, differences by occupational field were larger for women than for men, due to the component of pregnancy attrition. Contrary to expectation, pregnancy attrition was predicted about equally well or equally poorly as other later attrition. Unfortunately the job satisfaction data set that contained the best predictors of post-recruit-training attrition intent did not contain measures of actual attrition that would distinguish between pregnancy and other attrition. Without those criteria, the predictability of the two types of attrition cannot be appropriately compared.

The results indicate that attrition among Marine Corps women is a complex phenomenon influenced by many interacting factors. Development of a precise model of attrition behavior is not possible, given the current state of knowledge, although a general description is emerging, with different factors being important for different types of attrition.

Women who attrite during recruit training, in addition to those who are discharged due to erroneous enlistments, are those who are found to be unsuited for Marine Corps life. Even at the start of training, their intentions to remain are weaker than others, and their interest in combat-related activities and experiences with sports or male-oriented activities are small. The shock of recruit training seems to be enough to make their poor fit with the Marine Corps evident, and attrition follows.

Later, nonpregnant attrites have adjusted to the stresses of recruit training, but have more difficulty adjusting to actual Marine Corps life. They enter their jobs with higher than average combat interest scores and experience in male-oriented activities and high post-recruit training expectations. Placement as the unit typist, however, or lack of peer acceptance in a nontraditional job, may bring disillusionment. When they act out this disillusionment via behavior problems, drug use, or apathy, attrition results.

Two findings suggest that the majority of women who attrite due to pregnancy are not becoming pregnant in order to be discharged early. First, pregnancy rates for first-term enlisted Marine Corps women are similar to those for other women their age. Second, if these women were using pregnancy as an avenue to an early discharge instead of drugs or behavior problems, they would be expected to resemble other attriters in background or Marine Corps experience variables. Instead, they are very similar to nonattriters.

The differences between pregnant attriters and Marine mothers suggest that those who choose to remain in the Corps when pregnant are making a decision based on opportunities for caring for or supporting their children in either situation. Those who stay, who are more likely to be divorced or black or less educated, may see better opportunities within the Marine Corps.

Combining both motherhood and a Marine Corps career may be seen as more difficult for single women than for married women, who have another person with whom to share parenting responsibilities. This may explain why single women attrite more than married women, even though married women have an additional source of financial support beyond their Marine Corps pay check. Pregnant women also attrite less from clerical positions that may be easier to combine with motherhood than jobs in the field.

Rather than supporting the hypothesis that women become pregnant in order to attrite, the data suggest that women, at a particularly vulnerable age for pregnancy, become pregnant through accident or intention and then choose to remain or attrite based on many considerations, including their opportunities within and outside the Marine Corps

and their satisfaction with their Marine Corps career thus far. For the pregnant woman, this decision to stay or leave is probably not very different from that faced by other women and men at their reenlistment point. For pregnant women, however, pregnancy presents the opportunity to make that decision sooner.

The findings from this first phase have several implications for Marine Corps policy. Certainly, because women have much higher attrition, one recommendation might be to stop recruiting women at all. In addition to issues of fairness and equal opportunity, this action would be short-sighted. Women who enlist represent a pool of high-quality talent with high school diplomas and relatively high ASVAB scores. Also, costs for recruiting and maintaining women are generally lower than those for men (Hoiberg & Thomas, 1980). Therefore, before rejecting this recruitment source, the Marine Corps needs to know how much effort would be required to bring attrition down to an acceptable level. Also, an even more important reason for maintaining a component of women in the Corps is to have women leaders available in case a rapid expansion of both male and female forces is required during times of national emergency.

An alternative to stopping recruitment of women entirely would be to use the knowledge of who is likely to attrite to build a screening device for use by recruiters. Although a selection inventory or guidelines could be developed that might decrease attrition slightly, the potential payoff does not appear to warrant such a development at this time.

Recruiters could use the information about combat interest and male-oriented activities, however, to target their efforts toward women who are more likely to remain. They could, for example, ask coaches of women's high school teams or industrial arts teachers for names of prospects. They could seek out women in Junior Reserve Officer Training Corps (ROTC) programs or Explorer Boy Scout posts who are already familiar with being in mostly male groups. Such efforts have the potential of decreasing the numbers of women who attrite during recruit training.

Recruiting women with higher interests in sports and male-oriented activities also has the potential of producing more late attriters, however. These women might be kept from attriting by efforts to help them adjust and decrease the stresses they encounter or provide more opportunities for them within the Marine Corps, rather than by trying to screen them out.

Efforts to help women adjust and to provide additional opportunities for them should also make the Marine Corps more attractive to pregnant women faced with the decision of whether to remain or leave. Efforts to meet the special needs of Marine Corps mothers (and fathers) might also help decrease pregnancy attrition.

Finally, because most pregnancies do not seem to be deliberate efforts to obtain a discharge, because most teens have not had sex education in school, and because many pregnancies among teens are accidental (Zelnick, Kantner, & Ford, 1981) a significant number of these pregnancies may be unplanned. Provision of sex education information, therefore, has the potential to decrease the number of pregnancies, which would decrease both the amount of attrition and the amount of lost time due to pregnancy for non-attriters. Exemplary sex education programs for teens (Scales & Kirby, 1981) emphasize the importance of helping young people to apply the biological information to their own life-planning through training in values clarification, decision making, and communication skills. Such training in life-planning might have the potential to decrease other types of attrition as well as pregnancy.

CONCLUSIONS

1. The most important predictors of attrition for enlisted women appear to be variables related to Marine Corps experiences, such as occupational field or satisfaction with supervisor, rather than background variables, such as age or mental test scores. More specific information is needed, however, about the aspects of Marine Corps experiences that are related to attrition, before specific counter-attrition proposals can be made.

2. Although pregnancy accounts for the majority of the difference in attrition rates between men and women, results do not support the hypothesis that many women are becoming pregnant in order to be discharged. If many of these pregnancies are unplanned, a sex education program that includes life decision making has the potential for reducing pregnancy attrition.

RECOMMENDATIONS

1. The effects on attrition of specific Marine Corps experiences, particularly those in the work situation, should be examined.

2. The motivations of women Marines who become pregnant and the feasibility of decreasing pregnancy by conducting sex education and life decision-making training should be explored.

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APPENDIX

SUPPLEMENTARY TABLES

Table A-1

Multiple Regression Predictors of Recruit Training Attrition/Nonattrition for Male High School Graduates

Variable	Prediction Sample (N = 2868) Simple r	Multiple R	Increase in R^2	F	Final Beta	Cross-Validation Sample (N = 2436) Simple r
Cohort year	.015	.015	.000	--	.05	-.016
Geographic region	--[a]	.055	.003	1.45	.37[a]	---[a]
Race	--[a]	.061	.001	.64	-.24[a]	---[a,b]
Age	-.124	.139	.016	45.70***	-.13	-.108
Combat interests	.080	.168	.009	25.37***	.08	.087
AFQT	.068	.181	.005	14.19***	.08	.050
Male interests	.060	.193	.005	13.37***	.06	.018
Height/weight	.044	.199	.002	5.96*	.05	.096
Administrative interest	.064	.202	.001	3.65	.05	.038[b]
Electronic interest	.014	.205	.001	4.01*	-.04	.039[b]
Highest math course	.053	.206	.000	--	.02	.036[b]
Sports participation	.060	.206	.000	--	.02	-.013
Urban metropolitan	-.017	.206	.000	--	.00	-.020[b]

[a]Categorical data entered as a set with dummy coding.

[b]Due to their negligible contribution to prediction, these variables were omitted from second cross-validation.

Final multiple R	= .206
Final multiple R^2	= .042
Maximum possible R^2	= .250
Cross-validation r	
(using all variables)	= .135
(using best variables)	= .149

*p < .05.
***p < .001.

Table A-2

Mutiple Regression Predictors of Recruit Training Attrition/Nonattrition for Women

Variable	Prediction Sample (N=3272) Simple r	Multiple R	Increase in R^2	F	Final Beta	Cross-Validation Sample (N = 2763) Simple r
Geographic region	--[a]	.076	.006	.15**	1.36	--[a]
Race	--[a]	.095	.003	3.63*	.06	--[a]
Cohort year	-.001	.095	.000	—	.09	-.002
Combat interests	.090	.148	.013	42.77***	.11	.060
Highest math course	.080	.163	.005	15.34***	.05	.062
Administrative interest	.063	.170	.002	8.11**	.06	.092[b]
Sports participation	.054	.173	.001	3.32	.03	.030
Years of education	.040	.175	.001	2.58	.04	.049[b]
Age	-.018	.180	.002	5.08*	-.05	.003[b]
Urban metropolitan	-.009	.182	.001	2.46	-.03	.004[b]
AFQT	.042	.183	.001	2.05	.03	.041[b]
Electronic interest	.057	.183	.000	—	.02	.074[b]
Mechanical interest	.027	.184	.000	—	-.02	-.014[b]
Male interests	.053	.184	.000	—	.01	.019

[a]Categorical data entered as a set with dummy coding.

[b]Due to their negligible contribution to prediction, these variables were omitted from second cross-validation.

Final multiple R	= .184
Final multiple R^2	= .034
Maximum possible R^2	= .397
Cross-validation r	
(using all variables)	= .122
(using best variables)[b]	= .098

*p < .05.
**p < .01.
***p < .001.

Table A-3

Multiple Regression Predictors of Later Attrition/ Nonattrition for Male High School Graduates Entering the USMC in FY77 and FY78

Variable	Prediction Sample (N = 1469) Simple r	Multiple R	Increase in R^2	F	Final Beta	Cross-Validation Sample (N = 1141) Simple r
Geographic region	--[a]	.056	.003	.77	.85	--[a]
Race	--[a]	.102	.007	3.59*	.13	--[a]
AFQT	.081	.119	.004	5.57*	.03	.109
Age	-.063	.132	.003	4.72*	-.07	-.089[b]
Male interests	.044	.138	.002	2.47	.11	.012[b]
Sports participation	.028	.140	.001	.83	-.07	.000
Highest math course	.054	.142	.001	.77	.03	.078[b]
Combat interests	.065	.143	.000	—	.03	.110
Electronic interest	.009	.144	.000	—	-.04	-.051
Mechanical interest	.030	.145	.000	—	.01	-.039[b]
Height/weight	.007	.146	.000	—	.01	.009[b]
Administrative interest	.011	.146	.000	—	.01	-.023[b]
MOS category	--[a]	.154	.003	1.48	.01	--[a]
MOS match	.067	.159	.002	2.97	.04	.032[b]
Aviation MOS	.073	.161	.000	—	.02	.073[b]
MOS change	.050	.164	.001	1.48	.03	.040[b]
Marital status	—[a]	.190	.009	6.70**	.10	--[a]

[a]Categorical data entered as a set with dummy coding.

[b]Due to their negligible contribution to prediction, these variables were omitted from second cross-validation.

Final multiple R = .190
Final multiple R^2 = .036
Maximum possible R^2 = .410
Cross-validation r
(using all variables) = .176
(using best variables)[b] = .164

*p < .05.
**p < .01.

Table A-4

Multiple Regression Predictors of Later Attrition/ Nonattrition for Women Entering the USMC in FY77 and FY78

Variable	Prediction Sample (N = 1128) Simple r	Multiple R	Increase in R^2	F	Final Beta	Cross-Validation Sample (N = 844) Simple r
Geographic region	--[a]	.124	.015	2.92*	.75	--[a]
Race	--[a]	.149	.007	2.55	-.28	--[a]
Mechanical interest	-.086	.165	.005	5.83*	-.05	-.072
Highest math course	.068	.179	.005	5.58*	.06	.041
Administrative interest	.035	.184	.002	1.88	.03	-.007[b]
AFQT	.029	.187	.001	1.28	.02	-.016[b]
Height/weight	.033	.189	.001	1.19	.03	.048[b]
Age	-.034	.192	.001	.98	-.07	-.019[b]
Years of education	.028	.195	.001	1.24	.04	.024[b]
Electronic interest	-.037	.196	.001	.84	-.04	-.027[b]
Sports participation	.020	.198	.001	.74	.01	-.043[b]
Urban metropolitan	.041	.199	.000	—	.02	.011[b]
MOS category	--[a]	.210	.005	1.77	-.29	--[a]
Male interests	.017	.210	.000	—	.02	-.040[b]
MOS match	.053	.228	.008	9.14**	.09	.004[b]
Combat interests	-.052	.229	.000	—	.00	-.095[b]
Aviation MOS	.026	.232	.002	1.91	.04	.023[b]
MOS change	-.006	.232	.000	—	-.01	.049[b]
Marital status	--[a]	.280	.024	14.37***	.21	--[a]

[a]Categorical data entered as a set with dummy coding.

[b]Due to their negligible contribution to prediction, these variables were omitted from second cross-validation.

Final multiple R	= .280
Final multiple R^2	= .078
Maximum possible R^2	= .436
Cross-validation r	
(using all variables)	= .167
(using best variables)[b]	= .170

*p < .05.
**p < .01.
***p < .001.

Table A-5

Multiple Regression Predictors of Pregnant Attrition/ Nonattrition for Women Entering the USMC in FY77 and FY78

Variable	Prediction Sample (N = 1247)					Cross-Validation Sample (N = 1016)
	Simple r	Multiple R	Increase in R^2	F	Final Beta	Simple r
Geographic region	--[a]	.076	.006	1.18	-.11	--[a]
Race	--[a]	.120	.009	3.64*	.02	--[a]
AFQT	.042	.132	.003	3.84*	.04	.045
Male interests	.052	.140	.002	2.75	.17	.041
Sports participation	.031	.148	.002	2.73	-.13	.017[b]
Age	.042	.151	.001	1.00	.02	.051[b]
Highest math course	.041	.153	.001	.88	.02	-.008[b]
Height/weight	-.023	.154	.000	--	-.02	-.049
Administrative interest	-.003	.155	.000	--	-.01	-.060[b]
Electronic interest	.036	.156	.000	--	.02	-.026[b]
Mechanical interest	-.001	.157	.000	--	-.02	.005[b]
Urban metropolitan	.043	.157	.000	--	.01	.004[b]
Combat interests	.000	.157	.000	--	.01	.004[b]
MOS category	--[a]	.163	.002	.81	.08	--[a]
Aviation MOS	.017	.165	.001	.82	.02	.027[b]
MOS match	-.015	.165	.000	--	.00	-.038[b]
MOS change	.037	.167	.001	.63	.02	.083[b]
Marital status	--[a]	.188	.008	4.89**	-.02	--[a]

[a]Categorical data entered as a set with dummy coding.

[b]Due to their negligible contribution to prediction, these variables were omitted from second cross-validation.

Final multiple R	= .188
Final multiple R^2	= .035
Maximum possible R^2	= .518
Cross-validation r	
(using all variables)	= .148
(using best variables)[b]	= .148

*p < .05.
**p < .01.

Table A-6

Multiple Regression Predictors of Pregnancy Attrition/ Marine Corps Mothers for Women Entering the USMC in FY77 and FY78

Variable	Prediction Sample (N = 414) Simple r	Multiple R	Increase in R^2	F	Final Beta	Cross-Validation Sample (N = 331) Simple r
Geographic region	—[a]	.175	.031	2.14*	1.61	—[a]
Race	—[a]	.247	.030	4.37**	.19	—[a]
Age	.162	.286	.021	8.95**	.15	.114
Years of education	-.064	.324	.023	9.97**	-.17	-.057
AFQT	.071	.340	.011	4.94*	.08	.001
Height/weight	-.079	.354	.009	4.13*	-.10	.009
Administrative interest	.109	.363	.007	2.94	.06	-.002[b]
Male interests	.054	.364	.001	.44	.08	.083[b]
Urban metropolitan	.045	.365	.001	.34	.03	-.015[b]
Highest math course	.025	.366	.001	.31	.03	-.083[b]
Sports participation	.045	.367	.000	—	-.06	.060[b]
Mechanical interest	-.009	.367	.000	—	-.01	.070[b]
Electronic interest	.070	.367	.000	—	.02	.011[b]
MOS category	—[a]	.378	.008	1.19	.09	—[a]
MOS match	-.008	.379	.001	.39	-.05	-.004[b]
Aviation MOS	.006	.380	.001	.45	.02	-.022[b]
Combat interests	-.039	.380	.000	—	-.01	-.044[b]
MOS change	.094	.383	.002	1.13	.05	.123
Marital status	—[a]	.437	.044	10.58***	.32	—[a]

[a]Categorical data entered as a set with dummy coding.

[b]Due to their negligible contribution to prediction, these variables were omitted from second cross-validation.

Final multiple R	= .437
Final multiple R^2	= .191
Maximum possible R^2	= .518
Cross-validation r	
(using all variables)	= .266
(using best variables)[b]	= .292

*p < .05.
**p < .01.
***p < .001.

Table A-7

Differences in ASVAB Scores Among Post-Recruit Training Attrition Groups for FY78 and FY79

Subtest	F	Within-Group Means[a] OA	PA	NA
All Women (N = 2416)				
Mech. maint. composite	6.248**	92.28[b]	89.84[a]	88.88[a]
General information raw	4.346*	7.88[b]	7.38[a]	7.62[a,b]
Electronics info. raw	4.492*	17.31	16.76[a]	16.58[a]
Shop infor. raw	6.344**	10.36	9.84[a]	9.66[a]
Mech. interest	7.494***	8.51	7.42[a]	7.46[a]
Combat interest	5.807**	17.06	16.30[a]	16.31[a]
Administrative (01) (N = 616)				
Mech. maint. composite	4.786**	90.25	87.26[a]	84.76[a]
Combat composite	3.470*	105.72	101.62[a]	100.88[a]
General science raw	3.423*	12.87	12.17[a]	11.85[a]
Automotive info. raw	3.792*	7.70	7.65	7.07
Mech. interest	4.826**	8.17	6.46[a]	6.54[a]
Combat interest	5.529**	17.10	15.59[a]	15.47[a]
Supply (30) (N = 247)				
Clerical composite	3.247*	124.21	124.07	119.80
Administrative interest	3.093*	13.42[b]	13.75	12.61[b]
Combat interest	3.174*	16.50[b]	15.13	16.44[b]
Data Systems (40) (N = 71)				
General tech. composite	4.010*	133.50	123.53[a]	121.73[a]
Communications (25) (N = 71)				
Electronics composite	3.358*	110.52	109.54	105.29
Mech. main. composite	4.905**	91.52[c]	91.56[c]	83.90
Electronics infor. raw	5.976**	18.15[c]	17.20[c]	15.71[b]
Math. knowledge raw	4.516*	13.78[b,c]	14.73[c]	12.58[b]
Avionics (63/64/65) (N = 100)				
Electronics info. raw	3.277*	22.50	21.05[a]	20.14[a]
Combat interest	7.872**	20.00[b]	15.95[a]	17.98[a,b]
Military Police (58) (N = 67)				
General tech. composite	3.409*	118.43	123.43	115.00
Clerical composite	3.410*	123.00	128.57	119.92
Surveillance & comm. composite	3.160*	112.71	116.17	108.97
Shop information raw	3.637*	10.14	11.30	9.19
Utilities/Engineering/Ordinance (11/13/21) (N = 118)				
Surveillance & comm. composite	3.627*	102.68	106.79[a]	108.83[a]
Space perception raw	3.295*	12.58	14.45[a]	13.91[a]

[a]This mean differed significantly from that of the other attrites.

[b]This mean differed significantly from that of the pregnant attrites.

[c]This mean differed significantly from that of nonattrites.

Legend.
OA = Other attrition after recruit training.
PA = Pregnancy attrition.
NA = Nonattrition.

*p < .05.
**p < .01.
***p < .001.

Table A-8

Multiple Regression Predictors of Thinking of Quitting
for Women in Pay Grades 1 to 4

Variable Set	Sample 2 (N = 473) Multiple R	Increase R^2	F	Sample 2 (N = 448) Mutiple R	Increase R^2	F
Background Variables						
Race	.075	.006	.52	.086	.007	.65
Educational level	.088	.002	1.05	.089	.001	.25
Number of children	099	.002	.88	.090	.000	—
Pay Grade	.103	.001	.39	.090	.000	—
Marital status	.103	.001	—	.090	.000	—
MOS Variables						
Working out of MOS	.146	.011	2.53	.121	.006	1.43
MOS category	.300	.067	1.71*	.317	.086	2.10**
Amount of training	.313	.010	1.22	.327	.007	.77
Organization Level Variables						
Geographic location	.328	.009	1.54	.329	.001	.16
Command level	.348	.014	.60	.385	.040	1.70
Job Level Variables						
Harrassment	.379	.022	5.51*	.386	.001	.28
Job needs	.512	.119	67.71***	.514	.115	62.23***
Overall job satisfaction	.643	.151	108.43***	.662	.173	122.31***

*p < .05.
**p < .01.
***p < .001.

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