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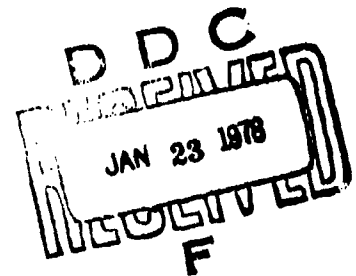
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Military Enlistment, Reenlistment and
Withdrawal Research: A Critical
Review of the Literature

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A critical review of the military literature indicates that incentives, organization practices, organization climate, job content, satisfaction, intention, expectations, demographic, psychological, aptitude, and performance variables, in isolation, explain a small percent of the variance in the dependent variable. In addition, the literature review notes that meaningful predictors (such as the size of the military accession age population, current and/or projected reemployment among this population, the rates of		

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20. of military wages to civilian wages, and DOD separation policies) have been omitted in much of the past research. The basic conclusion of the study is the need for the inclusion of additional predictors in multi-variate studies which have strong research designs.

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Introduction

Attrition among first term military personnel is an issue of justifiable concern. Martin (1977) reported attrition rates of: 20.7% in FY 1971; 21.3% in FY 1972; 23.6% in FY 1973; and 29.1% in FY 1974. Recently, (November 11, 1977) press dispatches quoted Assistant Defense Secretary John White as indicating a greater than 40% pre-end of first term enlistment attrition rate.

Pre-end of first term attrition cannot be evaluated in a vacuum. The cost and end-strength implications of attrition must be viewed in the context of: the size of the pool of potential accessions; success of recruiting efforts in attracting qualified accessions within the all-volunteer environment; and reenlistment rates. Further, evaluation of attrition depends upon, among other things, the performance of those being prematurely separated; whether attrition is occurring early in the term of enlistment when sunk costs are relatively low or later in the term when replacement costs are high; and the marginal costs of attempting to "salvage" a candidate for premature separation.

The objective of this paper is to critically review and summarize existing attrition research. However, since original choice, first term attrition, and reenlistment are inexorably related from both conceptual and policy perspectives, the review was broadened to include all three dependent variables. Additionally, studies that assessed behavioral intentions, other forms of withdrawal, and studies unrelated to withdrawal but of related interest were reviewed.

As will become evident, the preponderance of research has: focused on reenlistment intentions and behavior; focused on demographic-biographic

predictors or economic variables; accounted for relatively small percentages of the variance in the behaviors of interest; and suffered from various methodological shortcomings. The need for eclectic, multidimensional, and longitudinal research which captures individual, economic, and policy influences on attrition will be noted.

Research Studies Classification System

The matrix in Figure 1 will be used to classify the military research related to the entry and withdrawal processes. The dependent variables (criteria) are listed in the left column. These dependent variables are: original choice; attrition prior to completion of obligated service; actual reenlistment; intention or attitude toward reenlistment; completion of first term and recommended for reenlistment; other forms of withdrawal; and studies not directly related to withdrawal but of possible tangential interest.

The independent variables for the various studies are listed in the row across the top of the classification matrix. The independent variables move from economic and incentive variables to: organizational practices; organizational climate; job content; attitudes and satisfaction; intentions; expectations; demographic and biographical variables; psychological variables: aptitude scores; and performance.

Because of the diverse variables that have been studied, the multivariate nature of some studies, and a desire to be parsimonious, this classification matrix is an obvious oversimplification. However, it is felt that this matrix will provide a useful structure for organizing the literature.

The variable "organizational climate" is used in a very broad context for the purposes of the present review. It is recognized that this construct is the object of continuing controversy, but as it is employed in most cases in this paper, climate refers to the individuals' perceptions or descriptions of the military organization - how it deals with members, and/or the individuals' perceptions or descriptions of their current duty assignment.

Within each cell of the matrix is listed the reference number which has been assigned to the various studies. These numbers may be found in the reference section at the end of this literature review. In the event a number does not appear in a cell of classification matrix, no studies were found that dealt with that particular combination of independent variable and dependent variable.

The balance of this military literature review will be devoted to an analysis of the studies in each cell of the classification matrix. An attempt will be made to evaluate the practical contribution of the research for each classification cell, where appropriate. When more than one of the independent variables is utilized in the study, reference will be made to the total variance accounted for as well as the variance accounted for by that specific independent variable. Several of the studies do not report the variance accounted for. This omission will be noted where appropriate.

Research in the areas included in this literature review continue to be of interest to the military services. Very recent research may not have been included in this study because of the need to establish a cutoff date for review. Other research studies may have been inadvertently omitted. However, a devoted effort was made to include the great bulk of

the military research in the subject area since 1973. The authors of this paper are concurrently preparing a technical report reviewing the literature on the withdrawal process for the civilian economy.

Figure 1

CLASSIFICATION MATRIX FOR MILITARY
WITHDRAWAL STUDIES

Independent Variables Dependent Variables	Economic and/or Incentives	Organiz. tion Practices	Climate	Job Content	Attitudes and Satisfaction	Intentions	Expectations	Demographic and/or Biographic	Psychological variables	Aptitude scores	Performance
Original Choice	2, 19, 23, 34, 35, 45, 60	23	23			70	23	23			
Attrition Prior to Completion of Obligated Service		27, 31	54	54			54	3, 27, 28, 30, 47, 49, 50, 53, 54, 62, 65, 76	76	28, 49, 53, 62	
Actual Reenlistment	18, 33, 41, 44, 48, 52, 55, 57, 64		12, 57, 72	26, 32, 48, 64, 72	12, 26, 46, 72	1		10, 18, 26, 28, 32, 46, 48, 57, 54	28		46
Intention or Attitude toward Reenlistment	13, 20, 22, 23, 37, 59, 67, 71	4, 13, 22, 23	4, 8, 13, 16, 23, 39, 58, 59, 67	16, 54, 58, 59	8, 13, 16, 71		23, 67	37, 39, 58, 71			39
Completion of First Term and Recommended for Reenlistment	61		61					51, 66		61, 66	61
Other Forms of Withdrawal								17, 47	17, 47		
Studies Unre- lated to With- drawal Behavior	40, 43	43	43	43	5, 6, 9, 14, 15, 24, 36, 42, 43, 56		5, 43	24, 36, 63		5	63

Numbers in the various cells of the Classification Matrix refer to numbered studies in the Reference Section.

Economic Variables and Incentives Studies Related to
Original Choice

Altman and Fechter (1967) completed a study which attempted to estimate both the supply of military personnel and the additional budgetary costs of shifting to an all-volunteer military services. The study specified that legal and administrative constraints on recruiting practices made it difficult to segment variations in supply of enlistees (and officers) from variations caused by demand factors. Independent variables used to predict enlistment were 1) the size of the 18-19 year old male population rate, 2) the male 18-19 year old unemployment rate, 3) major changes in draft pressure and 4) seasonal factors. The conclusions of the study were that 1) periods of relatively high civilian unemployment tended to produce a greater than average number of volunteers, 2) periods of relatively high "draft pressure" (increased world tensions) also produced higher than average levels of enlistees, and 3) enlistments were above average in the quarter following high school graduation and below the yearly average in the fall and spring. The multiple regression analysis supporting the preceding conclusions accounted for 67% of the variance in the supply prediction equation. In addition, the researchers estimated that the annual marginal cost of maintaining a 2.65 million person all-volunteer military service to be between \$5.4 billion and \$8.3 billion, depending on the level of civilian unemployment. The regression analyses supporting the preceding conclusion accounted for 73% and 64% of the variance for the Army and All Service, respectively.

Fisher (1969), using an econometric model, also attempted to predict the annual marginal cost of maintaining military services at 2.65 million men in an all-volunteer environment. Fisher's predictors were the ratio of

civilian to military wages, the unemployment rate, and the accession rate. The time series regression analysis accounted for 90% of the variance in enlistment rate. The author comments that time series and cross sectional analyses "of the effect in changes in earnings on enlistments, with and without the draft, are in agreement." The study subsequently estimates that the annual marginal cost to maintain an all-volunteer service would range between \$5.7 billion and \$6.9 billion.

Klotz (1971), in a critique of Fisher's research, replaces the military accession rate with the military induction rate in an attempt to obtain "true" wage, unemployment, and draft effects. As a results of this change, Klotz estimated the annual marginal cost of an all-volunteer military service to be \$300 million to \$400 million.

Hansen and Weisbrod (1967) developed a model for the investigation of the effect of the draft on the size and distribution of gross national product. The results were somewhat general and the amount of variance accounted for was not stated.

Oi (1967), also estimated the marginal cost of maintaining an all-volunteer force. Oi indicated that elimination of the draft will reduce accessions not only by the 21% who were previously "true enlistees", but also by those who were "reluctant volunteers". Oi assumes that the preceding losses would be offset by improvements in retention. Predictors were pay levels adjusted for age and time in service. The criterion was enlistment in the armed forces. The study concluded that the annual marginal cost of maintaining an all-volunteer service of 2.65 million men would be \$4.0 billion plus transition costs and additional retirement benefits.

Glickman, Goodstadt, Korman, and Romanczuk (1973) developed protocols to assess the influence of factors affecting enlistment. Interviews were held with 53 men who made a commitment to enlist, 28 men who visited a recruiter but decided not to enlist, and 30 who received recruiting information but decided not to enlist. The results are given in percentage form. The most often cited positive responses (n=53) in the decision of those who decided to enlist were job training, travel, educational benefits, financial security, maturity, influence of the father, influences of male peers, and the influence of family in the Navy, influence of the mother and influence of other relatives. Thirty-two percent of those responding indicated financial/security considerations affected their enlistment decision. The most common negative factors (n=58) of those who decided not to enlist were to finish their education, job goals, length of enlistment, the loss of freedom, the influence of the recruiter, and the influence of male peers. The authors summarized their findings indicating that the youth in this sample were job and career oriented. The difference between those choosing to enlist and not to enlist appears to be whether or not the Navy was perceived as providing meaningful job and career goals. Because this study is multi-variate, it will appear in six other classifications.

Hause (1973) investigated the effect of employment opportunities on first term enlistment rates. The author indicated that his model did not incorporate relative military/civilian earnings and measures of the effect of the draft. In spite of these shortcomings, using a very large sample from the years 1957 to 1963, unemployment rate accounted for 43% of the variance in first term enlistment rate.

Summary - Economic Variables and Incentive Studies
Related to Original Choice

Altman and Fechter, Fisher, Hansen and Weisbrod, Klotz, and OI contributed research that attempted to deal with the expected cost(s) of an all-volunteer military service. The predicted marginal dollar cost varied from \$300 million to \$8.3 billion dollars. The bulk of the studies report a high percentage of the variance accounted for in the enlistment rate on the basis of the specified independent variables. No studies were found to verify the accuracy of the predictions made in these studies.

The Glickman, et al Original Choice study is based on small sample sizes. The results are stated in percentage form which does not permit an estimate of the amount of variance accounted for by the specified predictors. Future studies in this area should utilize substantially larger sample sizes and adequate sampling techniques in order to have meaningful generalizability. In contrast to the Glickman, et al study, Hansen utilized a very simple design where one variable (unemployment) accounted for 43% of the variance in enlistment rates.

A general critique of the Original Choice research would include a need for the inclusion of sampling techniques and/or larger sample sizes as well as a combination of economic data and data collected from individuals.

Economic Variables and Incentives Related to
Actual Re-Enlistment

Enns (1975), using FY 1971 data, with a sample of 1638 Navy, Air Force, and Army reenlistees, developed a regression model to estimate first term reenlistment rate. The independent variables for the Air Force and Army samples were the variables reenlistment bonus, proficiency pay, estimated civilian earnings, age, race, AFQT, and education. The independent variables in the Navy sample were the variable reenlistment bonus, base pay, age, race, AFQT, and education. The combined results for the Air Force model specified statistically significant predictors which included the VRB, age (negative coefficient) race, and education (negative coefficient). The prediction equation accounted for 35% of the variance in the reenlistment rate. The combined results for the Army model specified statistically significant predictors which included the VRB, estimated civilian earnings (negative coefficient), race, AFQT (negative coefficient), and education (negative coefficient). The prediction equation accounted for 32% of the variance in the reenlistment rate. The combined results for the Navy model specified statistically significant predictors which included the VRB, base pay (negative coefficient), race, AFQT (negative coefficient), and education (negative coefficient). The prediction equation accounted for 25% of the variance in the reenlistment rate. The VRB bonus was a significant predictor across all models, non-whites were found to reenlist at a higher rate across all models, and education was negatively related to reenlistment rate across all three models.

Haber and Stewart (1975) compared Navy reenlistment rates in 1971 and 1972. These years were chosen because a large pay increase, primarily

in the lower grades, was instituted in November 1971. The study assumed that comparable civilian earnings were unchanged in the specified time period. The general findings of the study indicate that a 1% pay increase resulted in a 3% increase in reenlistment rates for about one-half of the sample. Reenlistment rates for craftsmen went from 7.9% to 11.9% when no variable reenlistment bonus was given; whereas among craftsmen who received a VRB, the reenlistment rate went from 24.8% to 31.9%. The total of all occupational groups without a VRB went from 10.6% to 14.7%. All occupational groups with VRB went from 20.4% to 27.3%. Although not explicitly stated in the study, the non-VRB group increased its reenlistment rate by 38.6%, whereas the occupational groups receiving the VRB increased their reenlistment rate by only 33.8%.

Kleinman and Shughart (1974) found that the variable reenlistment bonus, using a linear regression model, accounted for 52.1%, 35.4% and 43.3% of the variance in first term reenlistment rates for FY 1965-67, FY 1968-69, and FY 1971-72, respectively. Using a logit regression model, for the same time periods, 45.3%, 19.4%, and 44% of the variance in FTRR was accounted for, respectively. With respect to second term reenlistment rate, the authors conclude that the VRB does not appear to have an effect on continuation within the Navy.

Lindsay and Causey (1969), used grade, race, military occupational specialty, and state of residence as predictors of actual reenlistment. The sample was divided into draftees, first term regular army, and career regular army. The average amount of variance explained by the study for the three samples, respectively, was about 2%, 4%, and 22%.

Massell (1976) studied a group of white, high school graduates with ages of less than 19½ years who were assigned to USAF electronics specialties and made their reenlistment decisions during FY 1972. The independent variable is "reservation wages," i.e., levels of military pay sufficient to induce reenlistment. Military pay was defined as basic pay, quarters allowance, subsistence allowance, federal tax advantage on non-taxable allowances, proficiency pay, reenlistment bonus, and the variable reenlistment bonus for a given specialty. The sample was divided into six subgroups. The percent of variance accounted for ranged from 38% to 89%. The author states that reservation wages are substantially higher than mean comparable civilian earnings. The model is designed to predict group, rather than individual, behavior. A critique of the study would include the observation that the standard deviations of all coefficients in the prediction equation were 3 to 5 times larger than their respective means. Statistical distributions that vary dramatically from a normal distribution are generally unreliable for prediction purposes.

McCall and Wallace (1969) examined how USAF reenlistment rate varied with changes in rate of pay. The research design included an experimental group of 505 airman who had electronics specialties who left the Air Force in 1962 and reported civilian earnings in 1964. The control group included 393 Air Force electronic specialists who reenlisted in 1962 after their first tour of duty. The findings of the study indicated that reenlistment rates would rise between 50% to 70% if pay were increased by \$1,000.00. The prediction equations explain 29.5% of the variance in reenlistment rate.

Nelson (1970) studied the reenlistment decision question in the Army. The independent variables were dependent status, Vietnam service, and combat

duty which was subsequently stratified by race, education, mental score, and military occupational specialty. The fourth independent variable was the ratio of military to civilian pay. This ratio, which is determined by "individual tastes for military service," is the minimum ratio required for an individual to reenlist. The dependent variable is the reenlistment rate. The sample is composed of first term enlistees in 1964. The findings of the study indicate (1) a 10% change in the ratio of military to civilian pay may affect reenlistments by 20-30%, (2) the post-Vietnam all-volunteer army may have 70% more enlistments than the 1967 Army, and (3) reenlistment rates for Blacks are dramatically higher due to variations in civilian earnings ability. The general findings of the study, without stratification, accounted for 57.2% of the variance in the reenlistment rate where relative pay was used as a predictor and 60% of the variance with absolute pay as a predictor. The coefficient for dependents, pay, and combat potential are positive and negative for Vietnam experience. Separate regressions are presented where stratifications of Black and White are utilized. The White relative pay equation accounts for 71.1% of the variance, whereas the Black relative pay equation accounts for 17.6% of the variance in reenlistment rate. The coefficients for the White equation are the same as for the general equation. The coefficient for the Black equation has positive coefficient for relative pay, dependent, and Vietnam and a negative coefficient for combat duty. When the data are modified by three categories of education, the variance accounted for drops to 22.2%, 30.3%, and 27.8%. Further changes occur in the coefficients of the independent variables. The author suggested that the poor fit in several of the equations suggests caution in the use of the equations for prediction purposes. Violation of

statistical test assumptions and/or considerations may have led to the discrepancies previously noted.

Quigley and Wilburn (1969) studied the reenlistment decision as a function of dollar pay, marital status, grades (E-2, E-3, E-4, E-5), proficiency pay (P-1, P-2), high school graduate, race, age at decision point, aptitude, years of schooling, average civilian earnings opportunities at decision, and Air Force Specialty Code. The general model accounted for 79.2% of the variance. When stratified by white, non white, high school graduate, and non high school graduate; the variance accounted for increased to 81.2%, 82.5%, 83.5%, and 82.9%, respectively. The significant positive predictors in the general equation are dollar pay, age, and race. The significant negative predictors in the general equation are: proficiency pay two, years of education, and civilian earnings. In each of the four previously mentioned stratifications, dollar pay is positive, high school graduation is negative, civilian earnings is negative, age was positive, and each of six occupational areas was positive.

Summary - Economic Variables and Incentives related to Actual Re-Enlistment

The studies in this section range in variance accounted for from 2%, to 83.5%. Several studies had methodological shortcomings which cast doubts on the validity of their results. Clearly, the Quigley and Wilburn study was a very productive research project. No major methodological flaws appear to exist and both the general model and the stratified models are consistent in both the predictors specified and the amount of variance accounted for. Future researchers would be well advised to build upon the combination of variables reported in this study.

Economic Variables and Incentives Related to
Reenlistment Intentions

Carlisle (1975), in a study of 1070 Marine enlisted personnel in the telecommunications field, used a difference in means test to compare those intending to reenlist and those not intending to reenlist. Each Marine was given several categories of Intrinsic and Extrinsic Job Factors to rate. The basic categories of Intrinsic Factors included the work itself, achievement, recognition, responsibility, and growth. Extrinsic Job Factors included working conditions, supervisor, peers, policies, family and social life, pay, job satisfaction, and career satisfaction. Statistically significant differences were observed between the group which intended to reenlist and the group which did not intend to reenlist. The findings indicated that those intending to reenlist had more career satisfaction. Career satisfaction appeared to be a function of feelings of worthwhile accomplishment and perceptions of their work. Those intending to reenlist had positive perceptions of their achievement, their growth, their responsibilities, the recognition they had received, and the work itself. Each of the above are intrinsic factors of the job. No extrinsic factors, for example, pay, effected their intention to reenlist. In contrast, those not intending to reenlist were affected by interference with family and social life, had negative feelings about organizational policies, administration, peers, and their supervisors. Policies were viewed as being too restrictive and constraining. Peers were viewed as being uncooperative and not helpful. Supervisors were viewed as being unresponsive. In addition, pay was considered to be inadequate by those planning not to reenlist. In summary, the research indicates that those intending to reenlist are satisfied

with intrinsic factors, but extrinsic factors did not appear to affect their intention to reenlist. Those deciding not to reenlist were primarily concerned with their dissatisfaction with extrinsic factors.

Fisher and Morton (1967), using a "non-linear dynamic programming algorithm" and "survey data," analyzed active duty pay, retirement pay, educational benefits, housing, fringe benefits, promotion opportunities, and incentives as predictors of reenlistment intentions. The authors conclude that "for every incentive . . . an increase in first term reenlistment rates results in an increase in costs." The authors recommended that the Navy offer selective reenlistment incentives rather than a general reenlistment incentive.

Glickman, Goodstadt, Korman, and Romanczuk (1973) interviewed five Navy men each in three ratings and in four time periods in the Navy ranging from 6 weeks to 45 months. A total of 60 enlisted men were interviewed. The findings indicated that interest in reenlistment declined with the number of months in the Navy. Factors affecting reenlistment intentions were stated in percentage form. The positive factors and the average percentage mentioning them were: training (36%), security (13%), travel (11%), and pay and benefits (11%). The negative factors and the average percentage mentioning this as affecting reenlistment intentions were: separation (64%), loss of freedom (51%), unmet expectations (51%), leaders and disorganization (42%), inequitable treatment (38%), busy work (36%), long hours/low pay (33%), and others. This section is concerned with economic incentives. Pay and benefits was fourth of four items in the positive factors and seventh of nine negative factors affecting reenlistment intentions.

Holoter, Bloomgren, Dow, Provenzano, Stehle, and Grace (1973) surveyed attitudes of 1711 Navy enlisted personnel. The general findings were that: career counseling had no effect on their decision to reenlist. In addition, agreement existed that the variable reenlistment bonus would have a favorable influence on a decision to reenlist. Blacks rated a Navy career as more financially advantageous (compared to a civilian career) than did whites. The amount of cash received as a reenlistment bonus had a greater impact on reenlistment intentions of whites than blacks.

The Army Office of Personnel Operations (1969) conducted a survey of 21,034 enlisted men asking how 27 factors were either an influence to stay or to leave the Army. Each item was ranked on a 7 point scale-ranging from "Strong Influence to Stay" to "Strong Influence to Leave." The factors on which more than 20% of the respondents indicated that it was a "Strong Influence to Stay" were: medical benefits, promotion opportunities, duty assignment, job security, retirement benefits, and educational opportunities. The factors on which more than 20 % of the respondents indicated that it was a "Strong Influence to Leave" were: personal life in the Army, leadership of officers and NCO's, frequency of moving, civilian job opportunities, Vietnam situation, Army food and facilities, number of working hours per week, wife's opinion of the Army (when married), and pay and allowances. Of particular interest to this section is that 26.2% of the respondents in 1968 indicated that "pay and allowances" were a "Strong Influence to Leave." Using all data in the study, a "retention index" was constructed. The retention index is derived by dividing the value of the "influence to stay" by the value of the "influence to leave" (or vice versa). The larger value was always used as the numerator. Thus, if the influence to stay is of higher value, the index will be positive. If the influence to

leave is of higher value, the index will be negative. The five highest indices "to stay" were medical benefits, retirement benefits, educational opportunities, opportunity to serve in the national interest, and promotion opportunities. The five highest indices "to leave" were: family separation, civilian job opportunities, Vietnam situation, personal life in the Army, and frequency of moving. Pay had a slightly positive index, but ranked next to last on positive indicators.

Schneider (1973), using instrumentality theory as a basis for collecting data, compared personal perceptions of Navy vs. civilian employment. Adequacy of pay was one of 30 outcomes included in the study. In a simple correlation between Navy and civilian outcomes, pay accounted for approximately 8% of the variance. The general findings of the study were that attraction of the Navy was positively related to reenlistment and career intentions for the 128 Navy personnel in the sample for their first, second, and third enlistments. A corollary finding was that attraction of a civilian occupation was negatively related to reenlistment and career intentions.

Stoloff, Lockman, Allbritton, and McKinley (1972), in a study of 3115 Navy men aboard ships, attempted to determine how psychological, economic, and demographic variables affect reenlistment intentions. On the basis of percentage data, reenlistment intentions were most often related to: pay and fringe benefits, advancement opportunities, duties, and retirement. On the basis of percentage data, the decision not to reenlist was most often related to: the military way of life, the amount of time spent at home, leadership, and compensation. On the basis of a regression analysis

which accounted for 31% of the variance in reenlistment intentions, job security and pro pay were among 12 statistically significant predictors.

Frey, Goodstadt, Korman, Romanczuk, and Glickman (1974) conducted two experiments to determine whether "more" incentives are actually "better" as a reenlistment incentive in the Navy. The first experiment had a sample size of 607 first term enlisted men who were administered questionnaires by mail. Single incentives were compared to complex incentives. Five single incentives (20 year retirement with $\frac{3}{4}$ pay, civilian training courses credited toward promotion, one term of educational leave with pay and tuition for every two years of service, 15 year retirement with $\frac{1}{2}$ pay, and leave the Navy at any time with 3 months notice) were found to be more attractive. The second experiment had a sample of 326 questionnaires administered by career counselors. The results of the second experiment essentially supported those in the first experiment. The authors conclude that "control of their fate" is of prime importance in incentives because leaving the Navy on 3 months notice was of primary importance.

Summary - Economic Variables and Incentives Related to Reenlistment Intentions

Of the studies reviewed, pay does not appear to be a potent cause of reenlistment. Carlisle and Glickman, et al found that pay and/or fringe benefits essentially had little effect on the decision to reenlist, but did effect the decision not to reenlist. Schneider's study indicated that pay accounted for a very small proportion of the variance. Stoloff found that pro pay and job security combined accounted for approximately 14% of the variance in reenlistment intentions. The research results to date indicate that pay is a predictor of the specified criteria. However, the magnitude of the variance accounted for is relatively small.

Economic Variables and Incentives related to
Completion of Four Year Enlistment with a
Recommendation for Reenlistment

One study (Plag, 1969) was found in this category. The criterion for this study was "effective sailors" which was defined as those who both completed a four year tour of duty and were recommended for reenlistment. The sample was composed of 3630 recruits entering the Navy in 1960. The sample was subsequently divided into a validation group (n=1829) and a cross-validation categorized into four stages which were A) pre-enlistment, B) second week of recruit training, C) the final week of recruit training, and D) more than two years of active duty. In stage A, fourteen background history variables and the AFQT were used as predictors. The multiple regression analysis produced the following beta weights: education (.229), expulsions (-.134), family stability (.081), and AFQT score (.134). Approximately 14% of the variance in "effectiveness" was accounted for by the preceding four independent variables.

In stage B, the independent variables included in Stage A, four measures of cognitive ability (General Classification Test Score, Arithmetic Score, Mechanical Score, and Clerical Score), and a clinical rating from a psychiatric screening examination. The multiple regression analysis produced the following beta weights: education (.206), expulsions (-.132), family stability (.088), arithmetic score (.153), and mechanical score (.075). Approximately 15% of the variance in "effectiveness" was accounted for in Stage B by the preceding variables.

In Stage C, four additional variables were added to the Stage A and B variables. The four additional variables were: average weekly test scores, disciplinary vs. non-disciplinary action, duty assignment, and transfers because of performance deficiencies. The multiple regression analysis

produced the following beta weights: education (.188), expulsions (.122), family stability (.081), arithmetic score (.102), failing grades in school (-.038), number of arrests (.048), weekly test scores (.091), and transfers because of performance (-.154). Approximately 17.6% of the variance in "effectiveness" was accounted for in Stage C by the preceding variables.

In Stage D, four additional measures were added to the variables of Stages A, B, and C. These were: officer rating of adjustment, record of disciplinary or commendatory action, pay grade level achieved after 2 years, and average semi-annual marks. The multiple regression analysis produced the following beta weights: expulsions (-.089), arithmetic score (.101), transfer because of performance (-.009), officer rating (.141), disciplinary action (-.133), pay grade (.150), and semi-annual marks (.135). Approximately 25% of the variance in "effectiveness" was accounted for in Stage D by these independent variables.

The author concludes that, even with additional information obtained from recruit training performance, prediction of "effectiveness" is not appreciably better in Stage C than in Stage A. It is also worthwhile to note that the predictors of "effectiveness" in Stage D are not only dramatically different than those found in Stages A, B, and C, but also these predictors increase the variance accounted for. A criticism of the study is that the variables are not related to either reenlistments intentions or actual reenlistment. Conclusions to be drawn from the study are:

- 1) predictors of "effectiveness" differ between recruit training and duty station assignments.
- 2) a relatively small amount of the variance is accounted for, and
- 3) a need exists for longitudinal models with an expanded number of independent variables.

Economic Variables and Incentives Studies
Unrelated to Withdrawal Behavior

Huck and Midlam (1977) developed a model to analyze the cost of first term enlisted attrition in the Navy and Marine Corps. The preliminary findings were that it is currently necessary to recruit 1.2 individuals who are male, high school graduates in mental grades I, II, and IIIA in order to insure that one individual is available for reenlistment at the end of four years. The cost to recruit and train 1.2 individuals is reported to be \$32,800. If the chances of an individual reenlisting are one in three, then the expenditure required to produce one reenlistment would be approximately \$100,000.

Katz and Schneider (1972), using a longitudinal research design with 6795 Navy men in AFQT categories I, II, and III, reported recruit perception of their training. The study was composed of two parts. Part I analyzed expectations of recruit training and subsequent actual recruit training experiences. The results of Part I indicated that about 60% were satisfied with navy life in general. The subjects anticipated before basic that physical training, marching, class work, and getting enough sleep would be a problem. Only getting enough sleep turned out to be an actual problem. Information about facilities (libraries, exchanges, etc.) were evaluated as being incomplete. More than one-half the sample reported little opportunity to discuss personal problems with higher authority. Part II of the study compared perceived Navy and civilian life in four areas (job related, interpersonal relations, physical and mental well-being, and education and training.) The results of Part IIA indicated that recruits valued highly getting faster promotions, good working hours, and pay at the outset of training and these values increased 13%, 9%, and 6% respectively. At the outset recruits felt

that they would find in the Navy that they could do a man's job, have good working conditions, and do the work they like the best. Responses after training showed these three factors to decrease 15%, 8%, and 12% respectively (no significance tests were calculated).

The results of Part IIB indicated that recruits appreciation for being treated fairly increased 7%. However, their perception of the Navy as having good supervisors, being able to discuss things with those in higher authority, getting treated fairly and working with good people decreased 20%, 16%, 10%, and 12%.

The results of Part IIC indicated that recruits valued highly 3 factors: good life, good living conditions and good food. They also felt that long separations from home and family, physical training, and standards of conduct and appearance were more likely to be outcomes obtained in the Navy rather than by being a civilian.

The results of Part IID indicated that training and education were valued highly at the beginning of training and also at the end. Also at the beginning of training, about $\frac{1}{2}$ of the sample perceived the Navy as instrumental in obtaining education. This dropped slightly after training (from 50% to 48%). Although there was a slight increase in intent to reenlist (8% to 12%), the majority (61%) were still undecided.

Overall many of the job related and interpersonal factors discussed above were not viewed as attainable by the sample, but were highly valued for mainly job related factors.

For purposes of this particular section of the literature review, the findings in Part IIA are most appropriate.

Summary - Economic Variables and Incentives

The bulk of the original choice models dealt with the projected costs

of an all-volunteer armed services. While the need for these studies is past, an analysis is needed of the actual versus the projected costs in order to establish the value of similar prediction studies in the future. In the all-volunteer time period, two original choice studies were reported. The basic recommendation for original choice models is to include both economic data as well as data collected from individuals.

Many of the actual reenlistment studies either had questionable methodology and/or accounted for small amounts of variance. The Quigley and Wilburn study accounted for a very large percentage of the variance by using a relatively large number of appropriate independent variables. Pay and its substitute (estimated civilian earnings) are predictors of actual reenlistment. These items are of particular importance to this section even though they are only a portion of a multivariate model. Future studies might consider the addition of additional economic variables external to the service. Examples might include unemployment rate, availability of civilian jobs for which earnings data is known, etc.

The studies reported on reenlistment intentions produce a somewhat confusing array of conclusions. Pay does not appear to be a potent predictor of intention to reenlist. Further, pay and fringe benefits essentially do not affect intention to reenlist, but do effect intention not to reenlist. One explanation of these seemingly contradictory results would be "other" variables within the services or the economic environment completely overpower pay as a predictor. These "other" variables are perceived differently by those intending to reenlist and those not intending to reenlist could possibly, but not certainly, be convinced by higher pay to reenlist. No analysis is made for the quality of potential reenlistees in either category.

The Plag study, which composed a category itself, accounted for a

relatively small percent of the variance, but does serve as a notable model for longitudinal studies. The inclusion of additional independent variables and a meaningful dependent variable, in conjunction with a similar design, might prove fruitful for future researchers.

Overall, the studies reviewed indicated that the amount of variance accounted for by pay was relatively small. Several of the studies had methodological faults which cast doubt on the validity of results - regardless of the amount of variance accounted for. None of the studies reviewed directly addressed the question of the "quality" of either of the reenlistees or those intending to reenlist. The composite also indicates a need to include measures of the economy (such as unemployment, wages of comparable civilian occupations, etc.) in future models attempting to predict reenlistment. Table 1 summarizes the findings for Economic and/or Incentive variables.

Table 1

Economic Variables and Incentive Studies

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Size of the 18-19 year old male population rate; 2. Male 18-19 year old unemployment rate; 3. Major changes in draft pressure. 4. Seasonal factors	Altman & Fechter (1967)	Army inductees	enlistment	$R^2 = .67$. Estimated cost of 2.65 million all volunteer military services \$5.4-\$8.3 billion. (annual)
1. Ratio of civilian to military wages; 2. unemployment rate; 3. accession rate.	Fisher (1969)	Army inductees	enlistment	$R^2 = .90$ (Time series regression analysis). estimated annual cost of 2.65 million All voluntary military service = \$5.7 - \$6.9 billion. annual cost of all-volunteer service = \$300-400 million. estimated.
1. "true" wage 2. unemployment rate 3. draft 4. military induction rate	Klotz (1971)	Army inductees	enlistment	
1. Draft	Hansen and Weisbrod (1967)	Army inductees	enlistment	NS: ¹

¹NS = Not Stated

Table 1 (cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Pay levels adjusted for age and time in service	Oi (1967)	Army inductees	enlistment	Estimated annual cost \$4.0 billion plus transitional costs and additional retirement benefits.
1. Protocols developed from interviews	Glickman et al (1973)	53 men who had made a commitment to enlist	enlistment	Most cited reasons for enlisting were: job training, travel, educational benefits, financial security, maturity, influence of father, influence of male peers, influence of family in the Navy, influence of mother, and influence of other relatives
1. Unemployment rate	House (1973)		enlistment	$R^2 = .43$
1. VRB, proficiency pay, estimated civilian earnings, age, race, AFQT, and education.	Enns (1975)	Air Force and Army enlisted	actual reenlistment	$R^2 = .35$, Air Force (significant predictors = VRB, age (negative), non-whites, and education (negative)) $R^2 = .32$, Army (significant predictors = VRB, estimated civilian earnings (negative), non-whites, AFQT (negative)

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. VRB, base pay, age race, AFQT, and education.	Enns (cont)	Navy enlisted		and education (negative) $R^2 = .25$ Navy (significant predictors = VRB base pay (negative), non-whites, AFQT (negative education (negative)
1. Pay increase	Haber and Stewart (1975)	Navy enlisted	reenlistment rate	General finding: 1% pay increase would result in a 3% increase in reenlistment rate
1. VRB	Kleinman and Shughart (1974)	Navy enlisted	1st terms and second terms actual reen- listment rate	$R^2 = .521$, .354 & 43.3 for FYs 1965-67, 1968- 69, 1971-1972 (linear regr. model) $R^2 = .453$, .194 & .44 (Logit regr. Model)
1. Grade 2. race 3. military occupational speciality 4. state of residence	Lindsay and Causey (1969)	Army 1. Draftees 2. 1st terms RA 3. Career RA		$R^2 = .02$ (sample 1), .04 (sample 2) and .22 (sample 3).
1. "reservation wages"	Maselli (1976)	USAF enlisted	actual reen- listment	Range in $R^2 = .38$ to .89 for six subgroups.

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Increase in pay rate	McCall and Wallace (1969)	503 USAF in experimental group. 343 USAF in control group	actual reenlist- ment	$R^2 = .295$, \$1000 increase would result in 50%-70% increase in reenlistment rate.
1. Dependent status; 2. Vietnam service; 3. combat duty 4. ratio of military to civilian pay Stratified by 5. race; 6. education; 7. mental score, 8. MDS.	Nelson (1970)	Army 1st term enlisted	reenlistment rate	$R^2 = .572$ (relative pay as a predictor) $R^2 = .60$ (absolute pay as a predictor) coefficients for depen- dents, pay, and combat were positive and negative for Vietnam service
1. Dollar pay 2. marital status 3. grade 4. proficiency pay 5. H.S. graduate 6. race 7. age at decision point, 8. aptitude, 9. years of schooling 10. average civilian earnings opportunities at decision. 11. AF specialty Code	Quigley and Wilburn (1969)	USAF enlisted men	actual reen- listment	$R^2 = .792$ (positive predictors were dollar pay, age, and race; negative: pro pay 2; and civilian earnings).

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
<u>INTRINSIC JOB FACTORS</u>	Carlisle (1975)	Marine enlisted	reenlistment intentions.	Significant differences between groups who in- tended to reenlist and those who did not for following variables: those intending to reenlist had 1. more career satisfactions 2. more positive per- ception of their achievement, growth, responsibilities, recognition they received and the work itself. No extrinsic factors discriminated between groups. Those not intending to reenlist reported more interference with family and social life, more negative feelings about organizational policies administration, peers, and supervisors. Also pay was viewed as inadequate.
<u>EXTRINSIC JOB FACTORS</u>				
1. work itself 2. achievement 3. recognition 4. responsibility 5. growth				
<u>EXTRINSIC JOB FACTORS</u>				
1. working conditions 2. supervisor 3. peers 4. policies 5. family and social life 6. pay 7. job satisfaction 8. career satisfaction				
1. active duty pay; 2. retirement pay; 3. educational benefits; 4. housing; 5. fringe benefits; 6. promotion opportunities; 7. incentives.	Fisher and Morton (1967)	Navy enlisted	reenlistment intentions	For every incentive an increase in first term reenlistment results in an increase in costs. 29 Navy should use a selective rather than general incentive system.

Table 1 (cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Protocols were developed from interviews.	Glickman et al (1973)	60 Navy enlisted	reenlistment intentions	<p>self-reported factors:</p> <p><u>Positive:</u> training security travel pay and benefits</p> <p><u>Negative</u> separation loss of freedom unmet expectations leaders and disorganization inequitable treatment busy work. long hours/ low pay.</p>
1. career counseling; 2. VRB	Holter et al (1973)	1711 Navy enlisted	reenlistment intentions	<p>career counseling had no effect. Only blacks saw Navy career as more financially rewarding.</p>
	Army office of Personnel Operations (1969)	21,034 Army enlisted	reenlistment intentions	<p>5 Strongest influence to stay. medical benefits, retire- ment benefits, educational opportunities opportunity to serve in national interest and promotional</p>

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Army Office of Personnel Operations (cont.)			opportunities 5 Strongest influence to leave: family separation, civilian opportunities Vietnam, personal life Army frequency of moving.
Personal perceptions of Navy vs. Civilian employment	Schneider (1973)	128 Navy enlisted	reenlistment intention	$R^2 = .08$ (pay)
1. Psychological 2. economic 3. demographic	Stoloff et al (1972)	3115 Navy men aboard ships	reenlistment intentions	$R^2 = .31\%$ with job security and pay as significant predictors.
1. Single or 2. complex incentives	Frey et al (1974)	607 first term enlisted in experiment 1. 326 in experiment 2.	reenlistment intentions	Fate control was of primary importance in incentives because of 1st choice: leaving Navy with 3 months notice.
1. Education 2. expulsions 3. 14 background history variables 4. AFQT	Plag (1969)	3630 Navy Recruits	Effective sailors	$R^2 = .14$, (Stage A) Education was positively related and expulsions were negatively related to criterion in Stage A (pre-enlistment) In Stage B (second week of recruit training)

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Plag (cont.)			<p>education family stability, arithmetic and mechanical scores were positively related and expulsions were negative related to criterion.</p> <p>$R^2 = .15$, (Stage B).</p> <p>Stage C (final week of recruit training)</p> <p>education, expulsions, family stability, arithmetic scores, weekly test scores were positively related and failing grades, and transfers were negatively related to criterion.</p> <p>$R^2 = .176$, (Stage C).</p> <p>In Stage D (more than 2 years of active duty)</p> <p>arithmetic scores, officer rating, pay grade and semi-annual marks were positively related while expulsion transfer because of performance and disciplinary action were negatively related to criterion.</p> <p>$R^2 = .25$, (Stage D).</p>

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	DATA	FINDINGS OR RELATIONSHIP
	Huck and Midlam (1977)	Navy and Marine Corps.	Costs of 1st term attrition	Costs to produce one reenlistment, based on attrition, recruiting and training costs = \$100,000.
PART I. Expectations versus actual experience during training	Katz and Schneider (1972)	6795 Navy enlisted	expectations about recruit and subsequent training.	PART I. Recruits anticipated that physical training, marching class work, and sleep would be problems; only sleep turned out to be a problem.
PART II. Compared perceived Navy and civilian life in four areas: job related, interpersonal relations, physical and mental well-being, and education and training				PART II. Recruits valued getting faster promotions, good working hours, and pay at the beginning of training and these values increased 13%, 9%, and 6% after recruit training. Also at the outset recruits expected that in the Navy they could do a man's job, have good working conditions and do the work they like the best. After training these items decreased 15%, 8%, & 12%. They also found a 7% increase 3 3

Table 1 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Katz and Schneider (cont.)			in being treated fairly, & 20%, 16%, 10% and 12% decrease in the Navy as having a good supervisor, being able to discuss problems with higher authority, being treated fairly and working with good people. They valued good life, good living conditions and good food and felt that separations from home & family, PT and conduct standards were more likely in the Navy than in civilian life.

Organization Practices Related to Original Choice

The Glickman, et al (1973) study was previously reviewed in the cross-classifications of Economic/Incentives and Original Choice and Economic/Incentives and intention to reenlist. Organization practices and the percentage of those responding how it affected their enlistment decision are as follows: job training (75%), travel (49%), educational benefit (47%), and military life style (2%). The most common organization practices which were considered to be negative to the decision to join the Navy were: length of enlistment (22%), loss of freedom (16%), moral aspects (14%), types of duty (14%), inability to quit (7%), and danger (5%).

Organization Practices related to Attrition Prior to Completion of Obligated Service

Greenberg and McConeghy (1977), in a study of 1000 enlisted men and 100 officers, utilized multiple regression analysis to distinguish between attriters and non-attriters. The findings, among recruits, indicate that attriters 1) believed that they would be harassed if they complained (12% of variance), 2) less often participated in a delayed enlistment program (4% of variance), and 3) less often have fathers who are employed in higher level positions, such as managers (4% of variance). Twenty per cent of the variance in attrition was accounted for by these variables. The findings, among regular duty marines, indicate that attriters 1) believe they would be harassed if they complain (7% of variance), 2) less often participated in delayed enlistment program (3% of variance), 3) are less educated (9% of variance), and 4) less often attend training school (4% of variance). Twenty three per cent of the variance in attrition was accounted for by these four variables. For both recruits and regular duty Marines,

statistically significant organization practices that predict attrition are harassment, delayed enlistment programs, and attendance at training schools.

Guthrie (1977), using an experimental group of 1152 and a control group of 960 Navy men, studied a voluntary release program in which the purposes of the study were both to expedite discharges of unproductive (or unsuitable) personnel and to reduce disciplinary problems. The experimental group were permitted to voluntarily leave the Navy within the first six months whereas the control group was expected to meet the usual conditions for discharge. The experimental group had a higher attrition rate, higher average performance, and fewer disciplinary problems.

Organization Practices related to Intention Toward Reenlistment

Bachman (1974), with a sample of 2522 Navy personnel and 1855 civilians, attempted to determine attitudes toward reenlistment. The results indicated that only 5% of those who see "limited opportunities" in the service were planning to reenlist. About 50% of those viewing the services as having "very good job opportunities" planned to reenlist.

Carlisle (1975), in a study previously reviewed in this paper, found no extrinsic factors that affected their intention to reenlist. However, organization practices (such as interference with family and social life, organizational policies, administration, peers, and supervisors) were related to intentions not to reenlist.

Frei, et al (1974) found that organizational practices (incentives) were more attractive if they were chosen singly than if chosen in packages. The findings of this study are somewhat inconsistent because "leaving the Navy on 3 month's notice" was considered the most important of all the incentives.

Glickman, et al (1973), in a study which was previously reviewed in this paper, found organization practices such as training, security, and travel positively affected reenlistment intentions. Organization practices such as separation from family, loss of freedom, leaders, disorganization, inequitable treatment, busy work, and long hours negatively affected reenlistment intentions.

Summary - Organization Practices

Multi-variate studies often included one or more organization practice variables. Only one study was found that utilized a multi-variate technique where the amount of variance accounted for was stated. In this instance, organization practice variables accounted for less than 15% of the variance in the particular dependent variable. The bulk of the remaining studies had results stated in percentage form. Research where the results are stated in percentage form are, at best, descriptive, but, in no sense, predictive. Drawing conclusions from studies with this type of statistics may be extremely misleading. The results of this section on Organization Practices are 1) that the one multivariate study indicates that Organization Practices account for a relatively small percent of the variance in withdrawal behavior and 2) no meaningful conclusions for future action may be drawn from the balance of the studies. Table 2 summarizes the findings for Organization Practices variables.

The military literature to date has shown minimal evidence to establish a strong relationship between Organization Practices and various forms of withdrawal behavior.

Table 2
Organizational Practices

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Organizational Practices	Glickman et al (1973)	53 men who had made a commitment to enlist.	enlistment	percentage of sample listing positive organization practices affecting enlistment: job training (75%). travel (49%), educational benefits (47%). military life style (2%). Negative organization practices and percentages responding: length of enlistment (22%), loss of freedom (16%), moral aspects, (14%), types of duty (14%) inability to quit (7%) and danger (5%).
Organization and Practices	Greenberg and McConeghy (1977)	1000 Marine enlisted and 100 officers.	attritions	Attriters (recruits) believed they would be harrassed if they complained ($R^2=.12$) less likely to participate in a delayed entry program ($R^2=.04$). & less likely to have fathers in higher level position ($R^2=.04$). Total $R^2 = .23$ Attriters (regular duty marines) believed they would be harrassed if they complained ($R^2=.07$);

Table 2 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Greenberg & McConeghy (cont.)			less likely to participate in a delayed entry program ($R^2=.03$); less educated ($R^2=.09$); and less likely to attend training school ($R^2=.04$). Total $R^2 = .23$.
Experimental Voluntary Release Program	Guthrie (1977)	1152 experimental and 960 central enlisted Navy men	attrition	Experimental group (individual's who could voluntarily leave the navy within the first 6 months) had a higher attrition rate.
Organizational Practice	Bachman (1974)	2522 Navy enlisted and 1855 civilians.	reenlistment intentions.	More likely individual's saw reenlistment as providing "limited opportunities," the less likely they planned to reenlist.
Organizational practices	Carlisle (1975)	Marine enlisted	reenlistment intentions	Related to intentions not to reenlist were: interference with family and social life, organizational policies, administration, peers, and supervisors.

Table 2 (con't)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Organizational practices (incentives)	Frey, et al (1974)	607 first term enlisted in Exp. 1; 326 in Exp. 2.	reenlistment intentions	Most important incentive: leave the Navy after giving a 3 month notice.
Organizational practices	Glickman et al (1973)	60 Navy enlisted	reenlistment intentions	Training, security, and travel was positively related to intentions; separation from family, loss of freedom, leaders, disorganization, inequitable treatment, busy work, and long hours were negatively related to intentions.

Climate related to Original Choice

Glickman, et al (1973) was previously reviewed in two sections of this paper. The Climate variables, expressed in percentage form, which positively affected the decision to reenlist were influence of the father (49%), influence of male peers (60%), influence of family in the Navy (43%), influence of the mother (45%), and influence of other relatives (36%). The Climate factors, expressed in percentage form, which affected the decision not to enlist were loss of freedom (16%) influence of the recruiter (41%), and influence of male peers (31%).

Climate related to Attrition Prior to Completion of Obligated Service

Mobley, Hand, and Logan (1977), in a preliminary report on a longitudinal study of attrition in the Marine Corps, measured individual variables (age, mental grade, education, race, dependents, Marine role attraction, and civilian role attraction), and organizational variables (leadership consideration; leadership Initiating Structure; group homogeneity, permeability, stability, hedonic tone, etc.; job skill variety, task significance, feedback, etc.). In a sample of 1,960 Parris Island recruits, the general findings of the study were that graduates and attrites differed on several variables prior to training. New recruits who subsequently graduate have higher expectations of completing recruit training; have higher intentions of completing recruit training, are more attracted to the Marine role; are moderately higher on the AFQT and mean education; expect more leader structure; and have higher internal motivation. In addition, the study reported that eventual graduates of recruit training are more satisfied than they expected to be; increase their expectancies of completing and their intention to complete; described leaders as being slightly more considerate and less

structured than expected; and perceived slightly less skill variety, task significance, and dealing with others than expected. Using a multiple regression model, with some difference in variables, the study accounted for 7.9% of the variance in actual attrition. The variables in this model were expectancy of completing first term enlistment ($r=.19$), education ($r=.17$), sum of positive minus negative role outcome expectancies, Marine ($r=-.13$), expectancy of finding an acceptable civilian job ($r=.10$), difference in role force: Marine-civilian ($r=-.15$), and difference in expectancies: Marine-civilian ($r=-.12$). Climate variables in the regression model would include the difference in role force between the Marine and civilian beliefs. The general findings would include the climate variables of intention to complete, attraction to the Marine role, and internal motivation.

Climate Related to Actual Reenlistment

Bruni, Jones, and James (1975), with a sample of 799 Navy enlisted personnel, produced a large number of biserial correlations between both psychological climate measures and reenlistment and job related attitudes and reenlistment. The variables and their specific correlations are listed below:

specialization (.13), routine technology (-.22), job challenge *(.17), professional esprit de corps *(.42), satisfaction (.47), security (.20), esteem *(.23), autonomy *(.22), pay (.18), appearance (.54), opportunity to get a better job *(.30), training for present job (.17), opportunity for promotion (.15), respect *(.18), job involvement *(.37), age (.18), GCT scores (-.15), education (-.13), ego needs *(.18), marriage (.22), and number of dependents (.36).

The variance accounted for by any one of the 21 variables ranged from 1.69% to 29%. The variables with an asterisk may be generally construed to be

variables of climate. The average bi-serial correlation for the climate variables is .25. That is, the average single climate variables explain 6.25% of the variance in reenlistment. The problems associated with drawing conclusions from statistics such as these will be discussed in the summary.

Nelson (1970), in a study which was previously reviewed in this paper, included a Climate variable in his study. The Climate variable was the ratio of military to civilian pay which was determined by individual "tastes" for military service. The research found that a 10% change in the ratio (based on a Climate concept) may effect reenlistment by 20-30%.

Stoloff (1971), in a study of 3,594 first term Navy enlisted men, studied both retention behavior and performance on the job. Forty-four independent variables were utilized that dealt with job content and job context or climate. A factor analysis of the variables indicated that living conditions, the job environment and the United States Navy in general clustered in a factor labelled Hygiene. A second factor analysis indicated that achievement, work situation, and compensation clustered in a job content factor. Using the same data base, Stoloff, using a regression analysis, found that the predictors (positive attitude toward the Navy in general, satisfaction with the immediate job involvement, and receiving proficiency and/or hazardous duty pay) accounted for 5.3% of the variance.

Summary-Climate related to Actual Reenlistment

One study used biserial correlation. Because no knowledge of the statistical independence of these variables is known, no meaningful conclusions can be drawn from the composite of the Navy variables. Another study in this section was theoretical in nature and would be somewhat difficult to operationalize in practice. The third study in this group accounted for slightly more than 5% of the variance in reenlistments.

The military literature indicates minimal evidence to establish a strong relationship between Climate and actual reenlistment.

Climate related to Intention to Reenlist

Bachman, in a study previously reviewed in this paper, attempted to determine attitudes toward reenlistment. Perception of job opportunities may be classified as a measure of Climate. The findings were that 50% of those perceiving the Navy as having "good job opportunities" planned to reenlist.

Bowers (1973), in a study of 2,522 Navy enlisted personnel, studied intention to reenlist using 31 predictors. Multiple regression analysis was used in a design where individual and group, levels of analysis were conducted. The individual level of analysis accounted for 16% of the variance in which the predictors (all positive) were human resources primacy, satisfaction, and the opportunity to control one's life. The group level of analysis accounted for 27% of the variance in which the predictors were supervisor's goal emphasis (negative coefficient), opportunity to control one's life (positive coefficient), and friendly people (positive coefficient).

Carlisle, in a study which has been reviewed twice in this paper studied reenlistment intentions. The Climate variable in the study appeared in several ways. Those intending to reenlist had positive perceptions of intrinsic factors, including their achievement, their growth, their responsibilities, and the recognition they had received. Climate variables (feelings about organization policies, administration, peers, and supervisors) also affected intentions not to reenlist.

Drexler (1975), in a study of 2,522 Navy personnel, attempted to assess reenlistment intentions using organizational climate variables, aspects of leadership, and group process variables as predictors. The predictors were made for draft motivated, choice motivated, and true volunteer accessions. The sample

size were relatively small ranging from 30 to 112. For the Climate measure, the percent of variance accounted for ranged from 3.6% to 39.7%. The equation in which 39.7% of the variance in reenlistment intentions was accounted for was in the category of true volunteers who were inexpensive to train. The primary predictors were human resource primacy (negative coefficient) and lower level influence (negative coefficient). The authors indicate that instability of the coefficients was caused by the small sample sizes.

Glickman (1973), in a study which was previously reviewed in this paper, also studied reenlistment intentions. Climate variables in the study were negative with respect to their influence on reenlistment intentions. The climate variables in the category were: loss of freedom (51%), leaders and disorganization (42%), inequitable treatment (38%), and busy work (36%).

Holz and Schreiber (1977), in a random sample of 1,564 Army enlisted personnel, assessed reenlistment intentions of both first term enlistees and non-first term enlistees. A preliminary correlation matrix was computed to supply predictors for a subsequent regression analysis. The first term enlistees (n=460) prediction equation accounted for 31% of the variance. The predictors were military work role (23% of variance), leadership (6% of variance), and acceptance of authority (2% of variance). Among non-first term enlistees (n=236), the prediction equation accounted for 38% of the variance in reenlistment intentions. The predictors were military work role (23% of variance), acceptance of authority (8% of variance), number of commendations (8% of variance), socio-economic status (3%), and leadership (1%).

Nelson and Berry (1966), utilizing a sample of 3600 first term male Marines and a longitudinal design, measured attitude change over a two year time period. After 10 weeks, attitude toward reenlistment and attitude toward the Marine Corps had a .25 correlation, and a .24 correlation with leadership. After two years, attitude toward reenlistment had a .44 correlation

with attitude toward the Marine Corps and a .42 correlation with attitudes toward leadership. The results indicate that the relationship between intention to reenlist and attitudes related to the service improved over time. In each case, the amount of variance explained improved from about 6% to about 19%.

The Office of Army Personnel Operations (1969) study was previously reviewed in this paper. Several Climate variables were mentioned in that study. The retention index included the following positive Climate variables: opportunity to serve in the national interest and promotion opportunities. The retention index included the following negative Climate variables: family separation, civilian job opportunities, and personal life in the Army.

Schneider (1973), has been previously reviewed in this paper. The purpose of the study was to compare personal perceptions of Navy versus civilian employment and to subsequently use the comparative data to explain reenlistment intentions. The findings indicated that attraction of the Navy was positively related to reenlistment intentions and attraction of a civilian occupation was negatively related to reenlistment intentions. The attraction of the Navy and the attraction of a civilian occupation may be construed as Climate variables.

Summary-Climate related Intention to Reenlist

The findings in this section are somewhat general. The two most general studies were those of Bachman and Schneider. The Bachman study found that 50% of those perceiving "good job opportunities" planned to reenlist and Schneider found that the "attractiveness of the Navy" was positively related to reenlistment. While those studies are interesting and provide future research opportunities, they do not provide adequate decision information. Two studies (Glickman and Office of Personnel, Army) utilizing percentages

appeared in this section. The majority of the Climate variables in the studies utilizing percentages were negative in their effect, e.g., loss of freedom, leaders, inequitable treatment, busy work, family separations, civilian job opportunities, and personal life in the service. Unfortunately, percentage results also provide little information of a concrete nature. Statistically, percentage data provides little basis for making decisions because not only is it difficult to identify the overlap among variables, but also it is difficult to determine the actual practical importance of the variables. Correlational studies, such as Nelson & Berry, provide some idea of the strength of the variable, but cannot identify interrelationships among more than one variable. Multi-variate studies (such as Bowers, Draxler, or Holz and Schneider) are able to distinguish both the independence of the variables as well as the strength of the variables. The Bowers study accounts for 16% and 27% of the variance at the individual and group level, respectively. Holz and Schneider's study accounts for 31% and 38% of the variance in first term enlistees and non-first term enlistees, respectively. While it is difficult to generalize about the composite findings of these two studies, they do appear to have somewhat consistent predictors. In contrast, the Draxler study, for reason of apparent statistical deficiencies, presents findings that are in contrast to the preceding studies.

In a general summary of the research in this section, the studies are somewhat contradictory making it difficult to reach substantive conclusions.

Summary-Climate

Nine studies were reviewed in which Climate was one of several predictors in the study. Eight studies either had methodological flaws, used non-predictive statistics, or account for a small percent of the variance in

withdrawal behavior. One study accounted for more than 30% of the variance. Table 3 summarizes the findings of Climate variables. Minimal evidence exists that establishes a strong relationship between Climate and withdrawal behavior.

Table 3
Climate Variables

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Climate variables	Glickman et al (1973)	53 men	enlistment	Factors positively affecting decision to enlist were: <ul style="list-style-type: none"> influence of the father, of male peers, of mothers, of other relatives Factors affecting the decision not to enlist were: loss of freedom, influence of the recruiter, influence of male peers.
climate variables: difference in role force between rated marine and civilian beliefs; intention to complete recruit training; leader structure; leader consideration;	Mobley et al (1977)	1960 Marine Recruits	attrition	Recruit graduates had higher intentions to graduate, were more attracted to Marine role; expect more leader structure than attrites. $R^2 = .079$.
Climate variables	Bruni et al (1975)	799 Navy enlisted	actual reenlistment	Job challenge ($r = .17$) professional de corps (.42) esteem (.23); autonomy (.22) opportunity to get a better job (.30) respect (.18); job involvement (.37)

Table 3 (Con't)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Bruni et al (cont.)			ego needs (.18) $r^2_{\bar{x}} = .063$
Ratio of military to civilian pay	Nelson (1970)	Army first term enlisted	actual reen- listment	10% change in ratio may affect reenlistment by 20-30%.
Climate Variables	Stoloff (1971)	3,594 first term Navy enlisted	actual reenlistment	Factor analysis indicated living condition, job environment, U.S. Navy in general clustered in a factor labeled Hygiene. none of the climate factors predicted criteria. $R^2 = .053$.
Perception of job opportunities	Bachman (1974)	2522 Navy enlisted and 1855 civilians	reenlistment intentions	50% of those who perceived the Navy as having good job opportunities planned to reenlist.
Climate variables	Bowers (1973)	2522 Navy enlisted	reenlistment intentions	$R^2 = .16$, positively related to criterion: human resources primacy; satisfactors, and opportunity to control one's life. $R^2 = .27$, negative related to criterion: \bar{y}

Table 3 (Con't)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Bowers (cont.)			Supervisor's goal emphasis; Positively related to criterion: opportunity to control one's life; friendly people.
Climate Variables	Carlisle (1975)	Marine enlisted	reenlistment intention	Individuals intending to reenlist had: positive perceptions of intrinsic factors, achievement, growth, responsibilities and recognition received. Individuals not intending to reenlist had negative feelings about organization policies, administration, peers, and supervisors.
Climate Variables	Drexler (1975)	2522 Navy enlisted	reenlistment intention	r^2 ranged from .036 to .397; human resource primacy and lower level influence were negatively related to criterion.
Climate Variables	Glickman et al (1973)	60 Navy enlisted	reenlistment intention	Loss of freedom, leaders and disorganization, inequitable treatment and busy work were found to be related to the decision to reenlist

Table 3 (Con't)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Climate Variables	Holz and Schreiber (1977)	1564 Army enlisted	reenlistment intentions	1st term enlistees: $R^2 = .31$ with military work role ($r^2 = .23$) leadership ($r^2 = .06$), and acceptance of authority ($r^2 = .02$) contributing to prediction. Non-first enlistees: $R^2 = .38$ with military work role ($r^2 = .23$), acceptance of authority ($r^2 = .08$) number of commendation ($r^2 = .03$) and leader ($r^2 = .01$) contributing to prediction.
Climate Variables	Nelson and Berry (1965)	3600 first term Marine enlisted	reenlistment intentions	Relationship between attitude toward Marine Corps and criterion improved over time.
Climate Variables	Office of Army Personnel Operations (1969)	21,034 Army enlisted	reenlistment intentions	Positively related to criterion were: opportunity to serve in the national interest and promotion opportunities. Negatively related to criterion were: family separation, civilian job opportunities, and personal life in the Army.

Table 3 (Con't)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Climate Variables	Schneider (1973)	128 Navy enlisted	reenlistment intention	Attraction to Navy: <u>Positively</u> related to <u>criterion.</u> Attraction to civilian occupation: <u>Negatively</u> related to <u>criterion.</u>

Job Content Related to Attrition
Prior to Completion of Obligated Service

Mobley, Hand, and Logan (1977), in a study previously reviewed in this paper, used the Job Diagnostic Survey to assess dimensions of "expected" job content and their relationship to attrition. The results of the study indicated that no job dimensions were related to attrition from recruit training.

Job Content Related to Actual Reenlistment

Grace, Holter, and Soderquist (1976), with a sample of 1,711 first term enlisted personnel, compared reenlistment intentions with actual reenlistment behavior. Approximately one year elapsed between the two measurements. Phi correlation coefficients were calculated to determine degree and direction of the relationships. The variables measured were motivation and job satisfaction. Job satisfaction included five needs areas (measured by the Porter Need Satisfaction Questionnaire), attitudes toward work (as measured by the Minnesota Satisfaction Questionnaire). Of 13 categories tested, seven were found to be related to reenlistment. One of the seven categories was the Job. Eleven constructs made up the Job Category. Phi coefficients ranged from .070 to .367. The amount of the variance accounted for ranged from 4/10 of 1% to 13.4% in the Job Content Category.

Stoloff (1971), in a study previously reviewed, reported that "satisfaction with the immediate job environment" was a predictor of reenlistment. As stated in the previous review, all predictors combined accounted for 5.3% of the variance.

Haber, Ireland, and Solomon (1974), in a study of the records of 700,000 Marines, studied reenlistment. The predictors were rank, number of dependents, race, education, military occupation, length of enlistment, combat

duty, age at enlistment, current primary job, home region of country, home county population, length of enlistment, mental group, and variable reenlistment bonus. Using a multidimensional contingency table analysis, the research found that the most important variables contributing to reenlistment were: rank, length of enlistment, number of dependents, current primary job, home region, and mental group. The study also reports that race, age, and population of county of residence have little impact on reenlistment rate. The authors state the probabilities of reenlistment for a given group cannot be applied to individuals from that group.

Lindsey and Causey (1969), in a study previously reviewed, list Military Occupation Specialty as one predictor of reenlistment. The variance accounted for was 2.28%, 4.63% and 23 for draftees, first term regular army, and career regular army, respectively.

Quigley and Wilburn (1969), in a study previously reviewed, included proficiency pay as a predictor of reenlistment. Proficiency pay may be considered a Job Content factor measured as proficiency pay is awarded to those jobs which are in scarce supply. Since the sample was drawn from a period of seven years (1959-1962) and since the variance accounted for was exceptionally high (about 80%), the study is worthy of careful perusal.

Summary-Job Content Related to Actual Reenlistment

Of the five studies reviewed in this section, one accounted for more than 30% of the variance in actual reenlistment.

Job Content Related to Intention to Reenlist

Drexler, in a study previously reviewed, studied reenlistment intentions using organizational climate, supervisory and peer leadership, and group

process and individual outcomes as predictors. The three basic classes of predictors were moderated by the "cost of attaining a specific skill." Using the cost of attaining a skill as a substitute for Job Content, the following results occurred. The average variance in reenlistment intentions explained for draft motivated volunteers was 7.7%. The average variance explained for true volunteers was 18.9%. The Draft Motivated individuals and the True Volunteers showed no appreciable differences among the moderating partitions "cost to attain."

Mobley, Hand, and Logan (1977), which was previously reviewed, used the Job Diagnostic Survey to provide a group of ten predictors of intention to complete first term enlistment. None of these predictors became a portion of the prediction equation.

Nelson and Barry, in a study previously reviewed, used "2 year MOS" and "2 year Command (ground or air)" as moderators of attitude toward reenlistment. The product-moment correlation were .03 and .01, respectively. That is, no relationship existed among the Job Content surrogates (MOS and Command) and reenlistment attitudes.

The Office of Personnel Operations (Army), in a study previously reviewed, included several Job Content factors in the questionnaire. Only one of these factors was among the top five mentioned as either a "Strong Influence to Stay" or a "Strong Influence to Leave." The item "Number of working hours per week" was the third strongest influence to leave. As previously indicated, all data was reported in percentage form.

Summary-Job Content Related to Reenlistment Intentions

Using "costs to attain" as a moderator for numerous other predictors (climate, leadership, and group process and individual outcomes), the

prediction of intention to reenlist is enhanced in the case of Choice Motivated individuals. Improving the prediction by partitioning suggests that much of the past research has been too broad in scope and that prediction may be improved in the future by using large samples partitioned into meaningful sub-classifications. The balance of the research reviewed on Job Content is either ambiguous or indicated that Job Content had little effect on reenlistment intentions.

Summary-Job Content

Table 4 summarizes the findings on Job Content variables. The military literature has shown that minimal evidence exists that Job Content is strongly related to withdrawal behavior.

Table 4
JOB CONTENT VARIABLES

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Job Diagnostic Survey (JDS)	Mobley et al (1977)	1,960 Marine enlisted	attrition	No job content dimensions were related to attrition
Job Content Variables	Grace et al (1976)	1,711 first-term enlisted	actual reenlistment	Φ^2 ranged from .004 to .134 for job category.
Job Content Variables	Stoloff (1971)	3594 first-term Navy enlisted	actual reenlistment	Satisfaction with the immediate job environment predicted criterion.
Current Primary Job	Haber et al (1974)	700,000 Marines	actual reenlistment	Predictor was one variable that contributed to reenlistment
Military Occupation Specialty (MOS)	Lindsay & Cousey (1969)	Army: 1. Draftees 2. 1st term R.A. 3. Career R.A.	actual reenlistment	Predicted reenlistment
Proficiency pay	Quigley & Wilburn (1969)	USAF enlisted	actual reenlistment	Predicted reenlistment ($R^2 = .80$)

Table 4 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Cost of attaining a skill	Drexler (1975)	2522 Navy enlisted	reenlistment intention	$R^2_{\bar{x}} = .077$ (draft motivated volunteers) $R^2_{\bar{x}} = .31$ (choice motivated individuals) $R^2 = .40$ (inexpensive to train individuals) $R^2_{\bar{x}} = .19$ (true volunteers)
JDS	Mobley et al (1977)	1960 Marine recruits	reenlistment intention	None of the dimensions of the JDS entered into the stepwise regression equation
1. "2 year MDS" 2. "2 year Command (ground or air)"	Nelson & Berry (1968)	3600 first term Marines	reenlistment intention	1. $r^2 = .03$ 2. $r^2 = .01$
Job Content Factors	Office of Personnel Operations (Army)	21,034 Army enlisted	reenlistment intention	Number of working hours per week was third strongest influence on criterion.

Satisfaction Related to Actual Reenlistment

Bruni, Jones, and James (1975) was previously reviewed. A large number of bi-serial correlations were computed between various attitudes and actual reenlistment. The correlation coefficient of "satisfaction" was .47. In view of the large number of other variables in this study that may be considered components of satisfaction, previously mentioned shortcomings associated with correlation studies are evident.

Grace, Holster, and Soderquist (1976) was previously reviewed. Thirteen categories were originally used as predictors of reenlistment. Seven of the thirteen variables were found to relate to reenlistment when combined into a single measure of career satisfaction. These variables were Job, Vital Statistics and Economics, Self-Worth/Esteem and Recognition, Growth and Expectancy, Recruiter/Retention, Family, and Career Counseling and Information. The average amount of variance accounted for by each of the above respective categories is: .032, .033, .020, .022, .004, .20, and .022. Because of the statistical properties involved the preceding data are not additive.

LaRocco, Gunderson, and Pugh (1975) was previously reviewed. The linear discriminant analysis accounted for 35% of the variance. General satisfaction with the Navy was "the third most important variable." Satisfaction with the Navy was also included in the profile of those who reenlisted. Conversely, the profile of those who were not recommended for reenlistment and/or were prematurely discharged were "least satisfied with the Navy." The variable "Overall Navy Satisfaction" accounted for 7.6% of the variance in reenlistment by itself.

Stoloff (1971) was reviewed in two previous sections. A regression analysis which accounted for 5.3% of the variance in reenlistment included one satisfaction variable.

Satisfaction Related to Intention to Reenlist

Bowers (1973) was previously reviewed. Satisfaction was one of three variables that accounted for 16% of the variance in intention to reenlist at the level of individual analysis. Satisfaction was not a predictor in the equation at the group level of analysis.

Carlisle (1975) was reviewed previously in two sections. The general findings of the study, based on differences in means between two groups, were that those reenlisting had more career satisfaction. Career satisfaction was related to feelings of worthwhile accomplishment and perceptions of their work.

Drexler (1975) was reviewed previously in two sections. Satisfaction was one of the facets of Group Process and Individual Outcomes. Satisfaction accounted for the greatest amount of variance among those individuals that were most expensive to train. Satisfaction generally ranked 3rd out of 4 among the specialties that were inexpensive to train. The sample sizes were small which resulted in a general instability in the coefficients. The beta values for satisfaction, however, were generally stable.

Stoloff (1972) was previously reviewed. The total prediction equation accounted for approximately 31% of the variance in reenlistment intentions. While the amount of variance accounted for by satisfaction is not specifically stated, it appears to be about one-half of the total amount. The components of satisfaction are: Navy career is satisfactory, Z grams, not desiring a civilian job compared to the Navy job, duty station and wife or girl friend attitude toward reenlistment.

Summary-Satisfaction

The studies in the Satisfaction section generally suffered from some

of the same problems as those in the preceding four categories. Specifically, methodological problems generally preclude drawing meaningful conclusions between the independent and dependent variables. Two studies, however, accounted for 35% and 31% of the variance, respectively. Table 5 summarizes the findings of Satisfaction variables. The balance of the studies provide minimal evidence establishing a strong relationship between satisfaction and withdrawal behavior.

Satisfaction and/or Attitude Studies Unrelated to Withdrawal Behavior

Ten studies were reviewed that appear to be unrelated to any form of withdrawal behavior. These studies will simply be noted with a brief description of the study.

Booth and Hoiberg (1973) studies change in attitudes (toward toughness, spirit, affiliation, and authority) over time of 735 Marines. Booth and Hoiberg (1974), analyzing this data, factor analyzed the 96 item questionnaire which reduced to 10 factors. Further analysis reduced the original number of items to 5 factors.

Bowers and Backman (1974) studies value changes in society and their possible implications for Navy manpower and management practices.

Clum, Hoiberg, and Cole (1969) explored attitude changes toward the USMC over time. The general findings indicated attitudes toward the Marine Corps became more positive - especially among those who were younger, had below average I.Q., and those from a lower socio-economic status.

Drexler (1974) investigated the effect of managerial and peer goal emphasis on individual values and preferences. Goal emphasis accounted for only minimal variance in values and preferences.

Goldsamt (1973), in a study of 1,837 category IV recruits, found that recruit training was less difficult than expected.

Holberg and Booth (1973), investigated changes in attitudes of Marines during the 1960's. In general, 1961 recruits had the most favorable attitudes and 1967 recruits had the least favorable attitudes.

Katz and Rafacz (1974) used occupational preferences as predictors of satisfaction in the Marine Corps. One finding was that individuals working in their preferred occupational field indicated greater job satisfaction.

Katz and Schneider (1972), in a study of 6,795 Navy men in AFQT categories I, II, and III found about 60% satisfied with Navy life in general. Recruits expected to have difficulty with physical training, working, class work, and getting enough sleep. Only "getting enough sleep" turned out to be an actual problem.

McDonald and Gunderson (1974), in a study of 5,851 Navy enlisted males aboard ships, found satisfaction to be significantly correlated with age, length of service, pay grade, co-workers, marriage, education (negative coefficient), and socio-economic status of parents (negative coefficient). In as much as the preceding ten studies are unrelated to withdrawal behavior, no summarizing comments will be made for this section.

Table 5
SATISFACTION AND ATTITUDE VARIABLES

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Satisfaction	Bruni et al (1975)	799 Navy enlisted	actual reenlistment	$r^2 = .22$
Career Satisfaction:	Grace et al (1976)	627 first term enlisted in sample 1; 218 in sample 2	actual reenlistment	1. $r^2 = .032$ 2. $r^2 = .033$ 3. $r^2 = .020$ 4. $r^2 = .022$ 5. $r^2 = .004$ 6. $r^2 = .20$ 7. $r^2 = .022$
1. Job				
2. Vital statistics and economics				
3. Self-worth/esteem and recognition				
4. Growth and Expectancy				
5. Recruiter/Retention				
6. Family				
7. Career counseling and information				
General satisfaction with the Navy	LaRocco et al (1975)	797 white Navy enlisted	actual reenlistment	Third most important variable ($r^2 = .076$) those who were <u>not</u> recommended for reenlistment and/or prematurely discharged were least "satisfied with the Navy"
Satisfaction	Stoloff (1971)	3,594 first term Navy enlisted	actual reenlistment	R^2 of the total equation = .053
Satisfaction	Bowers (1973)	2522 Navy enlisted	reenlistment intention	One of three variables that $R^2 = .16$ at the individual level of analysis. It was not a significant predictor at the group level of analysis.

Table 5 (cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Career Satisfaction	Carlisle (1975)	Marine enlisted	reenlistment intention	Those intending to reenlist had more career satisfaction (mean comparison).
Satisfaction	Drexler (1975)	2522 Navy enlisted	reenlistment intention	Satisfaction accounted for the greatest R^2 among those individuals who were most expensive to train. Satis- faction generally ranked 3rd out of 4 among specialties that were inexpensive to train.
Satisfaction	Stoloff et al (1972)	3115 Navy men aboard ships	reenlistment intention	$R^2 = .16$ (approximate)
Attitude change toward: toughness spirit affiliation authority	Booth & Hoiberg (1973)	735 Marine recruits		All attitudes were more favorable over time.
Same attitudes later as Booth & Hoiberg (1973)	Booth & Hoiberg (1974)	735 Marine recruits		Factor analyzed the 96 item questionnaire into 5 factors
Attitude change over time	Clum et al (1969)	489 Marine recruits		Attitudes toward Marine Corps generally became more positive over time especially for younger, lower I.Q. and lower SES individuals.

Table 5 (cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Managerial & peer goal emphasis	Drexler (1974)	2522 Navy enlisted	Individual values and preferences	Goal emphasis accounted for minimal variance.
Expectations toward recruit training	Goldsamt (1973)	1837 category IV recruits		Generally less difficult than originally thought.
Changes in attitudes during 1960's	Hoiberg & Booth (1973)	Marine recruits in 1961, 1967, 1969.		1961 group had most favorable attitudes; 1967 group had the least favorable.
Occupational preferences	Katz & Rafacz (1974)	all recruits entering USMC between Oct. 1972 & April 1973 to whom no special training commitment had been made.	Satisfaction	Individuals working in their preferred fields had greater satisfaction.
Expectations about aspects of training	Katz & Schneider (1972)	6795 Navy enlisted from AFQT categories I, II, & III		60% were satisfied with Navy life. Expected to have problems with P.T., work, class work, and "getting enough sleep." Only "getting enough sleep" turned out to be an actual problem.

Table 5 (cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
<ol style="list-style-type: none"> 1. Age 2. Length of service 3. Pay grade 4. Co-workers 5. Marriage 6. Education 7. SES 	McDonald & Gunderson (1974)	585; Navy enlisted aboard ships	satisfaction	Predictors 1-5 were significantly and positively related to criteria; Pre- dictors 6 & 7 were signifi- cantly and negatively related to criteria.

Intentions related to Original Choice

As part of a larger survey, Segal and Bachman (1976) asked over 12,000 graduating high school seniors in 1975, and over 13,000 in 1976 whether they would "probably" or "definitely" 1) attend vocational school; 2) serve in the military; 3) graduate from a 2 year college; 4) graduate from a 4 year college; or 5) attend graduate school, when they completed high school. In 1975, 14.2% and 14.5% in 1976 said they would "probably" serve in the military. This represented the smallest percentage of all the choices. The most frequent response, "graduate from a 4 year college," was selected by slightly more than 50% of the sample each year. Segal and Bachman followed up this study one year later. The individuals were re-surveyed who had stated they would "definitely" or "probably" serve in the military (n=2500). The results showed that 24% of that particular sub-sample were actually serving in the military.

Intentions related to Actual Reenlistment

Alley and Gould (1975) queried a sample of 54,803 first term enlisted Air Force personnel whether or not they intended to reenlist at the end of their present obligation. They also divided the sample by categories of their total months of active military service. Thus airmen with 1-12 months were considered in the first year group; those with 13-24 months were included in the second year group, etc. At the completion of four years of active duty, each individual's actual reenlistment behavior was obtained. The authors constructed four equations defining relationships between career intent and the actual career decision with the following functional forms: categorical, curvilinear, linear, and simple. Both the categorical and curvilinear equations predicted better than the other two. There were virtually no differences between the categorical and the curvilinear equations. Because

of problems inherent to the categorical model (e.g. lack of data for a particular category), the curvilinear equation was judged to be more useful and sufficiently accurate to serve as a basis for estimating reenlistment decisions. The results indicated that for "years one and two" the equation yielded low multiple R^2 with the criterion ($R^2=.02$ and $R^2=.03$, respectively), with improved prediction occurring for years three and four ($R^2=.14$ and $R^2=.28$, respectively). The authors also explored the prediction after four years and reported time differences in prediction. They concluded that updating the prediction system every 2-3 years would probably improve forecasting ability.

Summary-Intentions

In summary the results of the Segal and Bachman (1976) study suggested that there is only a small correspondence between intention and behavior. The results of the Alley and Gould (1975) study suggested moderate prediction of the actual reenlistment criterion only in the third and fourth years of the sample. The results of these studies are not directly comparable, however, because the Segal and Bachman results were reported in percentage form and Alley and Gould used regression. The Alley and Gould study predicts best for individuals in the fourth year of their first term. At best, the equation explains 28% of the variance. Because of the type of statistics used, it is not possible to determine the amount of variance accounted for in the Segal and Bachman study. The Segal and Bachman sample was asked to predict future behavior knowing little about the alternatives available to them. In the Alley and Gould study, first and second year groups had been in their present situation a short time and may have been too uncertain of their past experiences to accurately assess their intention regarding reenlistment. However, individuals in their 4th year, when prediction was best, were more likely to be aware of alternatives available to them and were more likely to be able to predict their

future behavior.

The results of these studies suggest that intentions are most accurate as predictors of behavior when they are obtained reasonably close to the actual behavior. However, even under this condition, prediction is poor. Refer to Table 6 for a summary of the results. The research results indicate that Intentions are predictors of the specified criteria. However, the magnitude of the variance accounted for is small.

Table 6
INTENTIONS

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
Intentions to enlist	Segal & Bachman (1976)	12,000 graduating seniors in 1975; 13,000 in 1976.	enlistment	From both samples approximately 14% said they would probably join a military branch. A follow-up 1 year later found that of this 14% only 24% were actually in the military.
Intentions to reenlist	Alley & Gould (1975)	54,303 first term USAF enlisted	actual reenlistment	$R^2 = .02$ (1st year) $R^2 = .03$ (2nd year) $R^2 = .14$ (3rd year) $R^2 = .28$ (4th year)

Expectations related to Original Choice

As part of a larger study investigating factors influencing both enlistment and reenlistment, Glickman, et al (1973), outlined a model of career motivation and socialization. Basically the model encompasses factors and processes affecting the enlistment decision and the reenlistment decision. Variables thought to affect enlistment were job training and educational opportunities. In the early stages of the enlistment decision, the role of the recruiter is theorized to be one of sensitivity to the needs of the individual, although emphasizing the more positive aspects of the Navy. This may produce unrealistic expectations within the individual. But other factors are present which may also influence early socialization. For example, the individual may believe that the Navy is efficient and well disciplined, and run by effective leaders and supervisors. He may also believe he is entering a masculine role that is rigorous, important, and that he will develop skills useful later in life. To the extent these expectations and ones like these are met by the Navy, the individual will likely to be satisfied. If they are not met by the Navy, dissatisfaction is likely. This is particularly important early in the individual's first term because it is likely to create a positive or negative set regarding the Navy. If the set is negative, the individual will probably accumulate grievances and/or actively seek out negative events to reinforce this view. During this time period, the individual is maturing and his values and interest are changing. Often, he has taken on the responsibilities of a wife and/or family. However, many areas exist where the individual and the wife have no control of decisions, e.g. where to live.

To explore the factors possibly affecting enlistment, Glickman et al (1973) interviewed 53 men who had given some commitment to enlist (all but two actually reenlisted); twenty-eight individuals who had visited a recruiter but who did

not enlist, and a group of 30 who had received recruiting information but did not enlist. In a second but similar study, the authors interviewed 20 college students who had contacted a Navy recruiter and 40 who had not. Protocols were established from the interviews and "frequency of mention" by the subjects was used to assess the influence of a factor effecting enlistment. The results of this type of data reduction showed that the following factors were positive influences on the decisions to reenlist: job training, peers, travel, father, educational benefits, mother, financial security, maturity, family member in the Navy. They also found positive and negative factors effecting the enlistment decision of those who did not enlist. Some positive factors were: travel, job training, and educational benefits. Negative factors were: finish education, recruiter, job goals on the outside appeared to be more appealing. The authors concluded that while both groups (enlistees and nonenlistees) were job and career oriented, the major difference appears to be in the perception of the Navy as providing or being able to provide these goals. The critique of this study in previous sections is equally applicable to this section.

Expectations related to Attrition Prior to Completion of Obligated Service

In the only study found exploring attrition and expectations, Mobley, Hand, & Logan (1977) reported the results of 1,690 Marine recruits who had entered training at Parris Island in August, 1976. Using graduation versus both "intention to complete" training and "actual attrition from training" as the criterion, the study longitudinally assessed individual expectations regarding the probability of attaining a number of outcomes valued either as a Marine or as a civilian. In addition recruit expectations were obtained regarding organizational characteristics such as leadership, job content, and group characteristics. Both intentions and actual attrition were used

as separate criteria, however only predictors of actual attrition were reported. Only the results of the regression analysis for pre-training measures will be reported here. The results of a stepwise multiple regression found the best single predictor of subsequent attrition to be the expectancy of completing first term enlistment ($R^2=.035$). Other predictors, in order of entry, were the sum of positive minus negative role outcome expectancies - Marine (.7%); expectancy of finding an acceptable civilian job (.6%); differences in role forces: Marine-Civilian (.2%); and difference expectancies: Marine-Civilian (.4%). The total variance accounted for by these 6 variables was 7.9%. These results were interpreted to mean that as recruits enter training, those who

"see a higher chance of completing their first term enlistment, have more education, expect the Marine Corps to lead to more positive than negative outcomes, see a lower chance of finding an acceptable civilian job, have a greater difference in Marine role force and civilian role force, and expect to be more satisfied, turn out to be of lower attrition risks (p. 186)."

Expectations related to intention or attitudes toward reenlistment

Since the model and the procedure for the Glickman, et al study was described in earlier sections of this paper, only the results related to reenlistment will be described in this section. Five Navy men were interviewed in each of the following stages in their first enlistment for three different ratings: 6-7 weeks; 6-12 months; 22-26 months; 39-45 months, for a total of $N = 60$ (4 stages x 3 different ratings x 5 individuals). The results showed that, overall, interest in reenlistment declined as the number of months in the Navy increased. But there were a number of positive and negative factors effecting reenlistment intention. Some of the positive factors were: training, security, travel, and pay and benefits. Some negative factors frequently mentioned by the sample were: separation, loss of freedom, unmet expectations, dissatisfaction with leaders and disorganization,

inequitable treatment, busy work, long hours, low pay, useless training, and favoritism to higher rank.

Schneider (1973) used a form of instrumentality theory as a model for surveying 128 Navy enlistees' attraction to both the Navy, and to a civilian alternative along with the desirability of attainment of these outcomes. Schneider suggested that the desirability and availability of alternatives to the Navy would influence the individual's reenlistment and career intentions. The results of this study showed that overall the sample expected that the civilian work and environment was more attractive than the Navy. As one would expect, reenlistment and career intentions were positively related to Navy attraction ($r^2 = .17$ and $r^2 = .13$, respectively) and negatively related to civilian attraction ($r^2 = .06$ and $r^2 = .07$, respectively). A difference score was calculated from the two attraction indices to examine the influence of the alternative work context. This difference score was then correlated with both reenlistment and career intentions. The results of this analysis showed an improvement in prediction of the results. Correlations for reenlistment and career intentions with the differences was significant ($r^2 = .29$ and $r^2 = .27$). These results indicate that as attraction to the civilian work role increased, the intention to participate in the Navy decreased.

Expectations related to Criteria Unrelated to Withdrawal

Katz and Schneider (1972) and Booth and Hoiberg (1973) both used a longitudinal recruit training design with 6,795 Navy men in AFQT categories I, II, and III and 735 Marine recruits, respectively. Katz and Schneider surveyed their sample at several points in time to assess their expectations regarding training and then their actual experiences. The results of the pre-training survey showed that physical training, marching, class work, and getting enough sleep were the most important anticipated problems. The follow-up results

showed that only getting enough sleep was an actual problem.

With regard to expectations, Booth and Hoiberg (1973) found that recruits with the most favorable attitudes toward spirit, affiliation, and authority were better adjusted personally and socially, expected to graduate from recruit training and to perform effectively in combat.

Summary-Expectations

In general the concept of expectations has been used in conjunction with factors influencing enlistment and reenlistment decisions (Glickman et al., 1973), the probability of attaining specific service related and civilian role outcomes (Mobley et al., 1977; Schneider, 1973), and in comparison to actual experiences (Katz and Schneider, 1972).

Specifically the finding that expectations regarding completion of training have been found to effectively discriminate between attrites and nonattrites (Booth and Hoiberg, 1973; Mobley et al., 1977) suggests two possible explanations. One is that attrites and nonattrites differ in certain personality trait dimensions such as confidence, anxiety, self-concept, etc. The other relates to state personality dimensions of similar types. This would suggest that an influence of the unknown--an anticipated stressful situation of recruit training--may interact with a particular personality dimension. One major difference in the two is that the latter may be more amenable to modification than the former. By providing individuals with realistic and accurate information about what to expect in training, it may be possible to reduce the anticipated stress of the situation. This process is supported by research in the industrial literature (Ilgen and Seely, 1974; Wanous, 1973). Another finding in this section is that the problems anticipated prior to recruit training were not found to be problems.

In conclusion, the concept of met and unmet expectations as an explana-

tory tool (Porter and Steers, 1973) may become quite useful to researchers. However, in the military research reviewed, it currently appears to account for a relatively small percent of the variance. Refer to Table 7 for a summary of results. It is believed that more theoretical specification is needed for the concept to be useful in prediction.

Table 7

Expectations

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Expectations about the military.	Glickman et al (1973)	53 men who had made a commitment to en- list (all but 2 did). 28 men who had visit- ed a recruiter but did not enlist. 30 men who had re- ceived recruiting information but did not enlist.	enlistment	from the frequency of mention of interviews the following positive factors influencing enlistment were named: job training, peers, travel, father, educational benefits, mother, financial security, maturity, family member in the Navy. Negative factors named by those not enlisting were: finish education, re- cruiter, attractive civilian alternatives.

Table 7 (cont)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Expectations of attaining desirable outcomes as a Marine.	Mobley et al (1977)	1960 Marine recruits	attrition in recruit training	Best single predictor was the expectations of completing recruiting training ($R^2=.035$); sum of positive minus negative role outcome expectancies for the following factors Marine ($R^2=.007$); Expectancy of finding an acceptable civilian job ($R^2=.006$); difference in role force: Marine-Civilian ($R^2=.002$); and difference in expectations: Marine-Civilian ($R^2=.004$). Total $R^2=.079$
2. Expectations of attaining desirable outcomes as a civilian.				
3. Expectations about: leadership; job control; group characteristics.				
1. Expectations	Glickman et al (1960)	60 Navy enlisted	reenlistment intention	Positive factors reported to affect reenlistment intention: training, security, travel, and pay and benefits; Negative factors frequently mentioned were: separation, loss of freedom, unmet expectations, dissatisfaction with leaders and disorganization, inequitable treatment, busy work, long hours.

Table 7 (cont)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. A version of expectancy theory.	Schneider (1973)	128 Navy enlisted	reenlistment intention	Overall, expectations about the civilian work and environment were more attractive than the Navy. Also, reenlistment and career intentions were positively related to Navy attraction ($r^2=.17$; $r^2=.13$) and negatively related to civilian attraction ($r^2=.36$; $r^2=.07$). They also reported that as attraction to the civilian work role increased, criteria increased ($r^2=.29$; $r^2=.27$; reenlistment and career intentions, respectively).
1. Expectations reggrading training compared with actual experiences	Katz and Schneider (1972)	6,795 Navy enlisted		Expectations of problems regarding: P.T., marching, class work, & getting enough sleep. Experience showed only getting enough sleep was an actual problem.

Table 7 (cont)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Expectations	Booth and Hoiberg (1973)	735 Marine recruits	attitudes	Recruits with the most favorable attitudes regarding spirit of affiliation, and authority, and were better adjusted personally and socially, expected to graduate and perform effectively in combat.

Demographic and/or Biographical Data related to Original Choice

The Glickman et al., (1973) study, reviewed in detail in earlier sections of this paper, examined selected background variables. Some of the background factors found to influence enlistment were the peer group, the individual's father and mother, and having at least one member of the family in the Navy. Father was reported to be a positive factor influencing those who decided not to enlist.

Demographic and/or Biographical Data related to Attrition Prior to Completion of Obligated Service

A large number of variables have been studied under this topic. But one of the more consistent variables has been the level of formal education. In one study of attrition, Lockman (1976) surveyed over 66,000 Navy recruits in 1963, obtaining information regarding age, education level, race, dependents and test scores. Recruits were grouped by combinations of predictors defined in binary form and loss rates were calculated from each group. The criterion of loss or survival was also binary. The variables were divided into 15 levels and all were used as predictors in a regression equation. The results showed that 92% of the variance was explained by the 15 predictors. The best single predictor of loss was lower education level, i.e. the lower the education level of the recruit, the more likely the individual would attrite from the Navy. This finding has been supported from other studies: Mobley et al. (1977) found that attrites from recruit training had less education than graduates; Greenberg and McConeghy (1977) reported similar results with attrites; and Plag et al. (1970) found that those who had completed high school were more likely to be an "effective" Marine. Plag defined an "effective" Marine by combining a variety of disparate indices of adjustment and performance most of which related to whether the individual was desirable for retention (e.g., suitability, recommendation for reenlistment, etc.). Mathews (1977)

found similar support for desertion and early attrition: those with high school diploma were less likely to desert or attrite, with $r^2 = 4\%$ and 5% , respectively. Guinn (1977) reported that regardless of mental group category, non high school graduates had much higher attrition rates.

Age has also been a factor related to attrition. In one study, Plag et al. (1970) surveyed over three thousand Marine enlistees using 63 predictor variables and the effectiveness criterion mentioned. The Plag et al. study found that the loss rate for the 17 year old group was highest, while the loss rate for 18 and 19 year olds was lowest. The finding regarding the 17 year old group was recently supported by Guinn (1977). Lockman (1975), on the other hand, found that the variable "20 and older" when used as an independent variable was positively related to loss. Mathews (1977) also found that those enlisting at age 21 or greater to be poorer risks, however the $R^2 = .5\%$. It appears that the relationship is not linear.

Lockman presented data to determine the relationship of race to loss. He found that minority loss rates were higher than non-minority loss rates. But when he partitioned by eligibility for military school, he found that the loss rate to be higher for non-minorities (26.3%) than for minorities (22.6%). In another partition, civilian education, the non-minorities group was higher (22.2%) than the minorities group (19.9%).

However, Mathews (1977) found that Caucasians were more likely to desert and to attrite early, but added little to the overall prediction equation. Plag et al. (1970) used effectiveness as the criterion with enlistees admitted under a "new mental standard" (lower than previously allowed). Although the difference was small, he found that minorities were less "effective" than non-minorities.

Several biographical/demographic scales/profiles have been found to be

related to attrition. Guinn et al. (1975) combined two subscales (Prediction of Emotional Instability and the Prediction of Drug Use Admission (or PDA) of the History Opinion Inventory to form an adaptation index. The PDA by itself was found to be almost as effective as the ADI in predicting attrition.

Richardson et al. (1975) used the Enlistee Profile (EP), Early Experience Questionnaire (EEP), the What's Your Opinion Questionnaire, and the Work Environment Preference Schedule to predict attrition within the first 180 days with an Army sample of 3,304. Attrites were found to answer two-thirds of the questions in the EP and the EEQ significantly different than those not attriting within the 180 day criterion. The combined EP and EEQ accounted for 17.6% and 10.2% of the variance respectively.

Marital status of the parents has been found in one study to be related to attrition. Plag et al. found that recruits whose parents were living together had higher effectiveness scores ($\bar{X} = .6492$) than when one or both were deceased ($\bar{X} = .5933$) or separated, divorced, adopted, or from a foster home ($\bar{X} = .5340$).

Not all the research has been positive with regard to demographic/biographic variables and attrition. Larson and Kristiansen (1969) related a number of scales (Personal Opinion Scale, Psychopathic Delinquency Scale, Neurotic Delinquency Scale and Subcultural Delinquency Scale; the Overall Acceptability, and several background variables with a criterion of early identification of potential disciplinary offenders. The criterion was comprised of several factors including Article 15, AWOL, court martial, undesirable discharge pending, and punitive discharge. This combination of predictors accounted for 3% of the variance.

Summary-Demographic and/or Biographical Data related to Attrition Prior to Completion of Obligated Service

The studies reviewed in this section suggest that education level may be the most consistent predictor of attrition of the biographical/demo-

graphic variables. Six studies (Greenberg & McConeghy 1977; Guinn 1977; Lockman, 1975; Mathews, 1977; Mobley et al., 1977; Plag et al., 1970) consistently found that the higher the level of formal education (i.e. through high school) the more likely the individual would not attrite.

The research relating age to attrition has been less consistent. Plag et al. (1970) found a positive relationship. However Lockman (1975) found that the highest loss rate was for the youngest group (17 year olds), the lowest loss rate was for 18-19 year olds, and the 20 and older group having a loss rate between the other two categories.

With the exception of the Lockman (1975) study, the variance explained by demographic/biographic predictors rarely exceeds 10%. When the Lockman study is examined, it is noted that grouped data were used as predictors, that is recruits were grouped by combinations of predictors defined in binary form and rates were calculated for each group of recruits. The utility of the Lockman analysis is limited to predictions of group behavior. The use of demographic/biographical variables to predict attrition seems to be based on the intuitive theory that those individuals who leave the military prior to the expiration of their term bring into the military a completely different set of personal characteristics from those who remain. Further, that given adequate time, money resources, etc., these characteristics can be identified, and the results will be a more accurate selection of individuals. It appears that the use of demographic/biographic data by themselves, will be inadequate as long as important situational constraints and realities of the military are not also given explicit concurrent consideration. A more comprehensive view of factors affecting attrition is therefore recommended for future research.

Demographic and/or Biographical Data related to Reenlistment

A large number of variables have been reported in this area of research. Race, has been reported in at least six studies (Enns, 1974; Grace et al., 1976; Haber et al., 1974; Lindsay & Causey, 1969; Nelson, 1970; Quigley and Wilburn, 1969) to be related to reenlistment. The Grace et al. and Haber et al. studies found that race had little impact on reenlistment. The Grace et al. study constructed tables and used phi coefficients to determine the relationships between variables for 627 first term enlisted men. These results were cross validated on a second sample of 218 by comparing means. In this manner it was found that "race other than white, proved to be the weakest of the significant predictors. Haber et al. (1974) used a multidimensional contingency table analysis with 700,000 marines, a large number of predictor variables, and a reenlistment criterion. The results of this study were that race had little impact on the reenlistment rate.

The four studies finding that minorities were more likely to reenlist than non-minorities used regression analyses (Enns, 1975; Lindsay & Causey, 1969; Nelson, 1970; Quigley & Wilburn, 1969). Whether or not this could account for the difference in findings is not readily determinable.

The influence of education on reenlistments has also been explored. LaRocco et al. (1974) used discriminant analysis with biographical data and 797 Navy, white, enlisted personnel to predict reenlistment. The results for the education level variable showed that those not recommended for reenlistment had less education than both those who reenlisted and those who were recommended but did not reenlist. Enns (1975), with a sample of 1,638 Navy, Army and Air Force reenlistees, found that education level was negatively related to reenlistment rate. This finding was supported in a study by Quigley & Wilburn (1969) where education was a significant contributor to two model equations

accounting for 79% and 90% of the variance. Two other studies have found that education had little impact on reenlistment (Haber et al., 1974, Nelson, 1970).

LaRocco et al. (1975) found that age was a significant predictor in a regression equation that accounted for 35% of the variance. The results showed that those who were recommended for reenlistment and actually did reenlist were slightly older than those who were recommended but did not reenlist and about 2 years older (on the average) than those who were not recommended or prematurely discharged. In contrast, Enns (1975) found, that age at enlistment to be negatively related to reenlistment rate. Haber et al. (1974) found that age had little effect on reenlistment.

Not surprising are the findings that grade or rank is positively related to, and typically one of the most significant factors, predicting reenlistment (Haber et al., 1974; Lindsay & Causey, 1969).

Another consistent, yet not surprising finding, is that the number of dependents a service member has serves to increase the probability of reenlistment (Haber et al., 1974; LaRocco et al., 1975).

Haber et al. (1974) have reported a number of other variables related to reenlistment. They found that the longer the length of first term enlistment (up to four years), the greater the probability of reenlistment. In addition, it was found that the military occupation of the member was an important factor in influencing reenlistment, e.g. the probability of reenlisting is 60% higher for individuals whose primary job is "general repair" than for individuals whose job is a ground combat specialty. Individuals classified as "other skills" had almost as great a probability of reenlisting as did those who were classified as "general repair." Clerical and related skills fell between "ground combat" and "other skills" for probability of reenlisting.

Region of the country has also been found to be related to reenlistment. Haber et al. (1974) found that individuals from the West had the highest probability of reenlisting. The South and North were next in order, respectively. The East had the lowest probability of reenlisting. Haber et al. (1974) found that the population size of the county of residence prior to enlistment had little impact on reenlistment. Other geographical variables have been found to be related to reenlistment. Lindsay and Causey (1969) grouped states into five categories on the basis of per capita income. The results indicated that the highest rate of reenlistment occurred with individuals from low income states. Further, that this relationship was negative linear. LaRocco et al. (1975) reported that reenlistees were more likely to have been brought up on poorer homes than those not reenlisting.

Summary-Demographic and/or Biographical Data related to Reenlistment

In summary the overall findings for this section are that a low and inconsistent relationship exists between the predictors and the criterion.

Demographic/Biographic Variables related to Intentions/Attitudes toward Reenlistment

Four studies were found to have demographic/biographic variables related to reenlistment intentions or attitudes (Holter et al. 1973; Holz and Schreiber, 1977; Nelson and Berry, 1968; Stoloff et al., 1972).

Stoloff examined the reenlistment intentions of 3,115 Navy men aboard ships in this first term of enlistment. Using regression analysis, they created a profile of a typical reenlistee. For the demographic/biographic variable, they reported that the typical reenlistee is married, has a larger family which lives near to the ship's home port, and comes from a family of lower socio-economic status. The finding that reenlistment is more likely among individuals with lower socio-economic status was partially supported in

the study by Holz and Schreiber (1977). They randomly selected a sample of 1,564 Army enlisted non-commissioned officers. They used a number of predictors with reenlistment intention as the criterion. The results showed that socio-economic status (in conjunction with other variables) was negatively related to reenlistment intentions only for non-first term enlistees, i.e., second term or career personnel. This variable accounted for 3% of the variance.

Holter et al. (1973) made an attempt to evaluate the impact of the Navy's Career Counseling Program on reenlistment intentions with a sample of 1,711 first, second or extended term enlisted personnel and its impact. Other variables were used but the results of the analysis by race showed that neither blacks nor whites thought the Career Counseling Program had any impact on their intention to reenlist.

Nelson & Berry (1968) examined change in attitudes toward re-enlistment over two points in time with 900 first term marines: 1) after 10 weeks of training; 2) after 2 years of service. The results showed that attitudes toward reenlistment decreased at the end of the 2 years of service.

Demographic/Biographic Variables related to Recommendation for Reenlistment

Plag (1969) classified 3,630 Navy recruits into effective or ineffective categories. An effective recruit was defined as having completed a 4 year term and being recommended for reenlistment. Ineffective recruits were defined as those having early separation and/or not recommended for reenlistment. Plag followed subjects for 4 years and administered the surveys four times: 1) pre-enlistment; 2) 2nd week of recruit training; 3) final week of recruit training; and 4) after 2 years of active duty. The results of multiple product-moment correlations of the uniquely significant variables for each stage showed that education and family stability was positively related to

effectiveness, and that the number of expulsions/suspensions from school was negatively correlated with effectiveness (except for Stage 3 where it was positively related to the criterion).

Sands (1976) used a criterion similar to the Plag (1969) study with the predictors being 1) AFQT score; 2) number of years of school; 3) number of expulsions/suspensions from school. The results of a regression analysis with his sample of 364 Navy personnel accounted for 9% of the variance. Regressions coefficients for the three independent variables were positively related to the effectiveness criterion. These findings are not totally consistent with the Plag study. For example, both studies found that education was positively related to effectiveness. The results of the studies disagree for the variable "number of expulsions/suspensions." Plag found it to be negatively related while Sands reported a positive relationship.

Demographic/Biographic Data related to other Forms of Withdrawal

Drucker et al. (1973) used a sample of 2,072 enlisted men to compare soldiers AWOL with a group not going AWOL on a number of variables. The results of t-tests between these groups indicated that AWOL subjects had significantly less education than the non-AWOL group.

Larson & Kristiansen (1969) attempted to predict disciplinary offenses in a sample of 1,999 male trainees with a number of biographic/demographic predictors. The total variance explained was 3%.

Demographic/Biographic Data and criteria unrelated to Withdrawal

Hoiberg and Booth (1973) compared the attitudes of 3 samples of recruits selected during 1961, 1967, and 1969. The size of the samples were 704, 476, 481 respectively. Although they were mainly interested in attitude differences among the three samples, several differences in demographic/biographical data were also reported. They found that the 1961 group was young, less educated

and more likely to be single. The 1967 recruit had a higher level of education and was more likely to be unmarried than the other groups. No statement was made of the sampling technique thereby casting doubt on the validity of the study.

Goldsmat (1973) compared pre and post training attitudes 1,873 category IV Navy recruits toward 21 attitudes items grouped into the following categories: job related factors; interpersonal relations; physical and mental well-being; education and training. He also used several biographical/demographic variables as moderators. The results of the analysis using the moderators, found race, education, and geographic area had some effect on modifying the means for the many of attitude items. The multiplicity of results were discussed in a previous section.

Flag et al. (1968) obtained samples of AFQT Category IV Navy and Marine corps enlisted personnel. A performance effectiveness scale was developed which was based on a number of conduct and proficiency ratings. Performance was measured at three points in time: 1) during recruit training 2) after 2 years of active duty; and 3) at the end of the 1st enlistment. For the Navy sample, "years of school completed" was positively related to effectiveness. For the Marine group, years of education, religious (Catholic) and age were positively related to the effectiveness criterion. Frequency of dating was curvilinear. Education was the best single predictor.

Summary-Demographic and/or Biographical

Overall the most noteworthy finding in this section is that - of all the biographical/demographic predictors of attrition reviewed here - the level of formal education is the most consistent predictor. Four studies were reviewed that found that the higher the level of formal education the more likely the individual would remain. It should also be noted that this relationship was

not always linear. The remaining demographic/biographical variables were somewhat inconsistent in the relationship to their respective criterion. When stated, the amount of variance accounted for was relatively small. Refer to Table 8 for a summary of results.

Table 8

Demographic and/or Biographical Variables

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Background variables	Glickman et al (1973)	53 men	enlistment	Positive influences on enlistment were: peer group, individual's father and mother, and having one family member in the Navy.
1. Education	Lockman (1976)	66,000 Navy recruits	attrition	Best single predictor = lower education level the more likely the attrition; total $R^2 = .92$.
1. Education	Mobley et al (1977)	1960 Marine recruits	attrition in recruit training	Attrites had less education than graduates ($R^2 = .025$).
1. Education	Greenbery and McConeghy (1977)	1000 Marine enlisted	attrition	Attrites were less educated.
1. Education	Plag et al (1970)	3445 Marine enlisted	effectiveness	Those completing HS. were more likely to be "effective" marines.
1. Education	Guinn (1977)	4051 USAF Security Police	attrition during tech school	Non HS grads. had higher attrition than HS grads..
1. Education	Mathews (1977)	45,948 Marines	desertion and early attrition	Individuals with HS diploma were less likely to desert or attrite ($r^2 = .04$ & $.05$).
1. Age	Plag et al (1970)	3445 Marine enlisted	effectiveness	Positively related to criterion.

Table 8 (cont)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Age "20 and older"	Lockman (1975)	66,000 Navy recruits	attrition	Positively related to loss.
1. Age "21 and older"	Mathews (1977)	45,948 Marines	attrition	1. Large losses. 2. Greatest losses. 3. Intermediate losses.
2. Age "17 years of age"				
3. Age "18-19 years of age"				
1. Race	Lockman (1975)	66,000 Navy recruits	attrition	Minority loss rate was higher than majority until data was moderated by school vs. non-school and HS grad. as non-HS grad..
1. Race	Mathews (1977)	45,948 Marines	desertion and attrition	Caucasians were more likely to attrite.
2. Race	Plag et al (1970)	3445 Marine enlisted	effectiveness	Minority group members were less effective than majority group members
1. Prediction of Emotional Instability (PEI) 2. Prediction of Drug Use Admission (PDA) 3. Combined 1 and 2 to form an ADI).	Gunn et al (1975)	15,252 USAF recruits	attrition	PDA alone was as effective as ADI.

Table 8 (Cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Enlistee Profile (EP); 2. Early Experience Questionnaire (EEP); 3. What's your opinion Questionnaire; 4. Work Environment Preference Schedule.	Richardson et al (1975)	3,304 Army recruits	attrition within first 180 days.	Attrites answered two-thirds of the questions of the EP and EEQ significantly different than those staying combined EP, $R^2 = .176$; EEQ, $R^2 = .102$.
1. Marital Status	Plag et al (1970)	3445 Marine enlisted	effectiveness	Recruits whose parents were living together had significantly higher effectiveness scores than recruits whose parents were separated, divorced, one or more were deceased, or the recruits were adopted or from a foster home.
1. Personal Opinion Scale; 2. Psychopathic Delinquency Scale; 3. Neurotic Delinquency Scale; 4. Subcultural Delinquency Scale; 5. Overall Acceptability Scale (OA);	Larson and Kristiansen (1969)		early identification of disciplinary offenders	R^2 of all predictors = .03. The highest single $r^2 = .01$ (OA with criterion).

Table 8 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
6. Several background variables	Larson and Kristiansen (Cont.)			
1. Race	Enns (1975)	1638 Navy USAF, Army reenlistees	actual reenlistment	Nonwhites were more likely to reenlist than whites.
1. Race	Grace et al (1976)	627 first term enlisted (sample 1) 218 (sample 2)	actual reenlistment	Race had little impact on satisfaction and subsequent reenlistment.
1. Race	Haber et al (1974)	700,000 Marine enlisted.	actual reenlistment	Race had little impact on criterion.
1. Race	Lindsay and Causey (1969)	Army FY 1966 separation records.	actual reenlistment	Race was one of several significant variables related to criterion.
1. Race	Nelson (1970)	Army first term reenlistees in 1964.	actual reenlistment	Reenlistment rate for whites was dramatically lower than for blacks. Attributed to potential civilian earning ability.
1. Race	Quigley and Wilburn (1969)	Individuals entering USAF between 1956 and 1962	actual reenlistment	Significant contributor to model equations.

Table 8 (Cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Education	LaRocco et al (1974)	797 white Navy enlisted	actual reenlistment	Individuals who were not recommended for reenlistment had less education than those who were recommended, but did not reenlist. Total $R^2 = .35$.
1. Education	Enns (1975)	1638 Navy and Army and USAF reenlistees	actual reenlistment	Education was negatively related to criterion
1. Education	Quigley and Wilburn (1969)	Individuals entering USAF between 1956 & 1962	actual reenlistment	Significant contributor to model equations
1. Education	Haber et al (1974)	700,000 Marine enlisted	actual reenlistment	Education had little impact on criterion.
1. Education	Nelson (1970)	Army first term reenlistees in 1964	actual reenlistment	Education had little impact on criterion.
1. Age	LaRocco et al (1975)	797 white Navy enlisted	actual reenlistment	Significant contributor to model equations. Total $R^2 = .35$. Individuals who were recommended for reenlistment and did reenlist were slightly older than those who were recommended but did not ⁹ reenlist and 2 years older than those who were

Table 8 (Cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	LaRocco et al (1975) (cont.)			not recommended or prematurely discharged.
1. Age	Enns (1975)	1638 Navy, Army, USAF reenlistees	actual reenlistment	Negatively related to criterion.
1. Age	Haber et al (1974)	700,000 Marine enlisted	actual reenlistment	Age had little impact on criterion.
1. Grade or rank	Haber et al (1974)	700,000 Marine enlisted	actual reenlistment	Positively related to criterion and one of the most important factors.
1. Grade or rank	Lindsey and Causey (1969)	Army FY 1966 separation records.	actual reenlistment	Positively related to criterion and one of the most important factors.
1. Number of dependents	Haber et al (1974)	700,000 Marine enlisted	actual reenlistment	Positively related to criterion
1. Number of dependents	La Rocco et al (1975)	797 white Navy enlisted	actual reenlistment	Positively related to criterion.
1. Length 2. MOS 3. Region of the country	Haber et al (1974)	700,000 Marine enlisted	actual reenlistment	1=Positively related to criterion 2=Important factor with "general repair" * (see back)

Table 8 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Haber et al (cont.)			White clerical and related skills fell in the intermediate range. 3=Order of most likely to reenlist = West, South, North, East.
1. Per Capita income grouping of states	Lindsay & Causey (1969)	Army FY 1966 separation records.	actual reenlistment	Highest reenlistment rate was with the lowest income group (negative and linear relationship).
1. Population size of county residence prior to enlistment	Haber et al (1974)	700,000 Marine enlisted.	actual reenlistment	Predictor had little impact on reenlistment.
1. Family income	LaRocco et al (1975)	797 white Navy enlisted	actual reenlistment	Reenlistees were more likely to have been brought up in poorer homes than non-reenlistees.
1. Demographic Biographical variables	Stoloff et al (1972)	3115 Navy enlisted aboard ships	reenlistment intentions	Typical reenlistee is married, has a larger family and comes from a family of lower SES.
1. Social economic status (SES)	Holz and Schreiber (1977)	1564 Army enlisted men and NCO's.	reenlistment intentions	SES was negatively related to criterion, but only for second-term or career personnel. $R^2 = .03$.

Table 8 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Career Counseling Program.	Holster et al (1973)	1711 first, second, or extended term enlisted	reenlistment intentions	When petitioned by race, neither race thought that predictor had any impact on criterion.
	Nelson and Berry (1968)	900 first term Marine enlisted.	change in reenlistment attitudes over time.	Attitudes toward reenlistment were more negative at the end of 2 years.
1. Demographic/Biographic variables over 4 time periods	Plag (1969)	3630 Navy recruits	effectiveness	Education and family stability were positively related to criterion; number of expulsions were negatively related to criterion.
1. AFQT 2. Number of years of school 3. Number of expulsions/suspensions from school.	Sands (1976)	364 Navy enlisted	effectiveness	Total $R^2 = .09$. All three regression coefficients were positively related to criterion.
1. Demographic/Biographic variables.	Drucker et al (1973)	2072 Army enlisted	AWOL	AWOL soldiers had significantly (t test) less education than non-AWOL soldiers.
1. Demographic/Biographic variables.	Larson and Kristiansen (1969)	1999 male trainees	disciplinary offenses	Total $R^2 = .03$.

Table 8 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Demographic/Biographic variables	Larson and Kristiansen (cont.)	3 samples of Marine recruits 1961, N = 704 1967, N = 476 1969, N = 481		Individually, none of the predictors were found to be useful. Several differences in the predictor were noted among the samples: 1961 sample was younger, less educated and more likely to be single. 1967 sample had a higher level of education and was more likely to be unmarried than the other samples.
1. Demographic/Biographic variables as moderators.	Goldsamt (1973)	1973 Category IV Navy recruits	attitudes	Race, education, and geographic area had some effect in modifying the means of the attitudes.
1. Demographic/Biographic variables	Plag et al (1968)	AFQT Category IV Navy and Marine enlisted	effectiveness at three points in time	"Years of school completed" was positively related to criterion for the Navy sample. "Years of education, Catholic religion, and age were positively related to criterion for the Marine sample." "Dating frequency" resulted in curvilinear data.

Psychological Variables related to Attrition
Prior to completion of Obligated Service

Yellen (1975) investigated the prediction of discharge for delinquent behavior using the Delinquent Behavior Inventory (DBI) with 2,500 Navy recruits during first week of basic training. Specifically the study reported a negative attitude toward authority and discipline, delinquents had a general disregard for law and order, a lack of motivation, and a general exhibition of antisocial behaviors. However, the DBI accounted for only 6% of the variance.

Psychological Variables related to Other Forms of Withdrawal

Two studies were found that related psychological inventories to disciplinary offenses (Larson & Kristiansen, 1969) and AWOL (Drucker et al., 1973). Drucker et al. administered the California Psychological Inventory (CPI) to 2,072 enlisted men and compared those who went AWOL with those who did not. The results from the CPI showed that those absent without leave scored significantly lower on all nine CPI scales than did the non-AWOL enlisted men. The research utilized the test for differences in means. The percent of variance accounted for cannot be determined by this test. Larson & Kristiansen found the Personal Opinion Scale and the Overall Acceptability Scale not to be very useful in predicting future disciplinary offenses.

Summary-Psychological Variables

The studies reviewed in this section either accounted for an extremely small percent of the variance or were designed in a manner that did not permit the amount of variance accounted for to be stated. Minimal evidence was found establishing a strong relationship between psychological variables and forms of withdrawal behavior. Refer to Table 9 for a summary of results.

Table 9
Psychological Variables

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Delinquent Behavior Inventory (DBI)	Yellen (1975)	2500 Navy recruits	attrition	Total R^2 of DBI = .06. Delinquents were more likely not to like themselves, had a more negative attitude toward authority and discipline, a general disregard for law and order, a lack of drive, and general exhibition of anti-social behaviors
1. California Psychological Inventory (CPI)	Drucker et al (1973)	2072 Army enlisted	AWOL	AWOL soldiers scored lower on all 9 CPI scales than the non- AWOL soldiers.
1. Personal Opinion Scale; 2. Overall Acceptability Scale.	Larson & Kristiansen	1999 male trainees	future disciplinary offenses	Predictors were not useful in predicting criterion.

Aptitude related to Attrition
Prior to Completion of Obligated Service

Recently Guinn (1977) described the results of an attrition study with aptitude variables entering into prediction. The study attempted the early identification of attrites. Two measures of aptitude were employed: Armed Service Vocational Aptitude Battery (ASVAB) and the Armed Forces Qualification Test (AFQT). These measures were used in combination with various age and educational standards. The results of this study suggest that, with a combination of predictors, judicious use of a selection index may result in savings associated with military and technical training. The combination of variables found to be feasible for use was a composite score, age, and a non-high school graduate. A second portion of the attrition study attempted the early identification of Security Police attrites. The procedure employed was to administer three measures to a sample of 4,501 basic airmen who had been assigned to the security police AFSC. The measures were: 1) History Opinion Inventory; 2) Airman Assessment Inventory; and 3) Vocational Interest Career Examination. The results of regression analysis of these measures in combination with aptitudinal data resulted in a multiple $R^2 = .21$. The model was reported to be able to identify correctly 94% of the sample after technical training.

Mathews (1977) used a large number of aptitude and other variables in a stepwise multiple regression format and was only able to account for 10% of the variance. The criterion was attrition within two years. The following aptitude scores entered negatively into the equation but did not individually account for more than 1% of the variance: Classification Inventory, Pattern Analysis, General Information, Arithmetic, Verbal. The AFQT was positively related to attrition.

Lockman (1976) grouped recruits into categories of mental groups by dividing up AFQT scores in regression analysis. For the mental groups, the

highest two mental categories (93rd percentile & above and 65-92 percentile) were negatively related to losses while the lowest categories (31st-48th and 30th percentile & below) were positively related to losses. This suggests that the higher AFQT scores (MGI and II) are associated more with "loss" while the lower AFQT (MG III and IV) are associated more with "stay". The overall equation with 15 variables accounted for 92% of the variance, however the equation was predicting group behavior rather than individual behavior.

As mentioned in earlier sections of this paper, Plag et al. (1977) attempted to predict military effectiveness from a variety of disparate indices of adjustment and performance in 3,445 "new mental standard" marines. The analysis was done in three stages. The stages were described in detail in an earlier section of this paper. The results of the regression analysis for Stage 1 found that 4 variables accounted for 7% of the variance. The four variables comprising the model equation (and their Beta weights, all positive) were: Education (.1776); Army Qualification Battery average (.0990); Parents Marital Status (.0981); and age (.0837). The Stage II and III analyses for those Marines graduating from recruit training were as follows: In Stage 2, six variables entered and accounted for 8% of the variance. The beta weights were: Education -.16; age -.11; Basic- Average (arithmetic reasoning, mechanical aptitude, general information test) -.09; Parents Marital Status -.08; Race .08; AQB - AE (Armor, Artillery, and Engineering) -.07. In Stage 3, seven variables accounted for 8% of the variance. The beta weights were: Education -.15; age -.10; Race -.09; Parents Marital Status -.09; AQB - AE -.09; Proficiency Platoon .08.

Aptitude Scores related to Actual Reenlistment

In an attempt to predict an airman's reenlistment potential, 3,062 first-term enlistees who had completed 2.5 - 3.5 years of active duty were used to develop a Reenlistment Potential Index, used in conjunction with aptitudinal scores and final disposition of in/out of service. This study accounted

for 30% of the variance using biographical, aptitudinal, & attitudinal data. Contributions of aptitude scores to the equations, or the directionality of the coefficients were not supplied. However, by using computer-determined cutoff scores, 81% of the sample were correctly classified with respect to the reenlistment decision. Fifty-six percent of the reenlistees were incorrectly indentified, while 6% of the group who actually left the service were incorrectly classified as careerists.

Aptitude Scores related to Recommendation for Reenlistment

Plag (1969) surveyed 3,630 Navy recruits in May and August of 1960 at four stages: Stage A - prior to enlistment; Stage B - 2nd week of training; Stage C - final week of training; Stage D - after 2 years of active duty. Plag used a large number of variables adding several at each stage using an effectiveness criterion considering an effective sailor as one who completed 4 years and was recommended for reenlistment. Ineffective sailors were those having early separations and/or those not recommended for reenlistment. The results of multiple correlations of the aptitude variables at each stage showed that AFQT was positively related to effectiveness only at Stage A ($r^2 = .02$). Arithmetic scores were positive related to the criterion at Stages B, C, and D ($r^2 = .02$, $.01$, and $.01$, respectively), while mechanical scores were only significantly and positively related at Stage B ($r^2 = .015$). The amount of variance accounted for at Stages A, B, C, and D were .144; .152; .176; and .25, respectively.

Using a similar criterion of effectiveness, Sands (1976) developed an odds for effectiveness table (OFE) using aptitude test score, number of years of school completed and number of expulsions/suspensions from school as predictors. This was a revision of an earlier OFE table which also included number of arrests. The sample consisted of 3,649 divided into a developmental sample of 2,471 and an evaluation sample of 1,178. The aptitude scores were

the AFQT scores divided into 4 categories similar to the I-IV categories used by the services. The results of the regression analysis was a regression equation from which the OFE-2 table could be constructed. The regression coefficient from that equation for the AFQT variables was .82. The amount of variance accounted for by the complete equation or each independent variable was not stated.

Aptitude and Studies Unrelated to Withdrawal

Holberg and Booth (1973) measured attitudes toward the Marine Corps of 735 recruits at four successive stages: 1) Beginning of training; 2) End of phase I; 3) End of phase II; and 4) End of training. They also collected aptitude data from the General Classification Test (GCT). The results of correlations with four attitude subscales and aptitude data indicated that those who had the most favorable attitude toward toughness had lower aptitude than other recruits ($r^2 = .156$). On the other hand, recruits who had a more favorable attitude toward spirit tended to be of higher aptitude than other recruits ($r^2 = .095$).

Summary-Aptitude

Refer to Table 10 for a summary of results. The studies using individual data accounted for variance ranging from 7% to 30%. However, even within this range, some methodological problems existed.

The use of grouped data appears to be meaningful for the military services. High amounts of accounted for variance are possible through the use of grouped data because the individual variances are lost. Assuming that the military services are primarily interested in retaining specified "groups" rather than specified individuals, grouped data appears to be a viable approach to data analysis.

Table 10
Aptitude Variables

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Aptitude variables: Armed Service Vocational Aptitude Battery (ASVAB); Armed Forces Qualification test (AFQT)	Guinn (1977) Study I	3,062 first term enlistees.	attrition	They found a combination of aptitude and biographical variables to be useful in developing a selection index.
1. Aptitude variables	Guinn (1977) Study II	4051 USAF Security Police trainees		Total $R^2 = .21$ with the following measures; 1) History Opinion Inventory;

Table 10 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Guinn (1977) Study II (cont.)			2) Airmans Assessment Inventory; and 3) Vocational Interest Career Examination in combination with the aptitude variables. Total $R^2 = .10$.
1. Aptitude variables	Matthews (1977)	45,948 Marines	attrition	The following aptitude scores entered negatively into the model equation but individually did not account for more than 1% of the variance: Classification Inventory, Patterns analysis, General Information, Arithmetic, Verbal. AFQT was positively related to attrition.
1. AFQT	Lockman (1976)	66,680 male recruits	attrition	Highest 2 categories of AFQT were negatively related to loss, while the lowest 2 categories were positively related to losses. Total $R^2 = .92$.
1. Aptitude variables	Plag et al (1977)	3445 "new mental standard" marines	effectiveness	Stage I, $R^2 = .06$ (cross validation) found 4 variables with positive beta weights: education (.1776); AQB (.099); $R^2 = .09$

Table 10 (Cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Plag et al (1977)			<p>Parents marital status (.098); & age (.083)²</p> <p>Stage II; $R^2 = .06$ (cross validation) all with positive beta weights: education, .16; age, .11</p> <p>Basic average, .05; Parents marital status, .08; Race, .08; AQB, .07.</p> <p>Stage III, $R^2 = .05$ (cross validation) with positive beta weights: Education, .15; age, .10; race, .09, parents marital status, .09, AQB, AE, .09. Proficiency Platoon, .08.</p>
1. Aptitude variable	Guinn (1977)	3,062 first term enlistees	actual reenlistment	<p>Total $R^2 = .26$ (cross validation) of biographic, aptitude and attitude variables (individual contribution of aptitude scores or direction of the coefficients were not supplied).</p>

Table 10 (Cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. AFQT 2. Aptitude variables	Plag (1969)	3630 Navy recruits	effectiveness	AFQT positively related to criterion at Stage A; Arithmetic scores were positive in the following stages: $B = r^2 = .02$ $C = r^2 = .01$ $D = r^2 = .01$ Mechanical scores were significant and positive at Stage B ($r^2 = .015$). Total $R^2 A = .142$ $R^2 B = .144$ $R^2 C = .144$ $R^2 D = .267$
1. AFQT	Sands (1976)	3649	effectiveness	Odds for effectiveness table was constructed using aptitude test score, number of years of school completed, and number of expulsions/suspensions from school. Total $R^2 = .82$.
1. General Classification Test (GCT)	Hoiberg and Booth (1973)	735 Marine recruits	attitudes toward USMC	Recruits with the most favorable attitudes toward toughness had lower aptitude scores ($r^2 = .156$). Recruits

Table 10 (Cont.)

PREDICTOR(s)	AUTHOR(s)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Hoiberg and Booth (1973) (cont.)			who had a more favorable attitude toward spirit were more likely to have a higher aptitude ($r^2 = .095$).

Performance Related to Actual Reenlistment

LaRocco et al. (1975) obtained performance satisfactoriness data on 797 Navy, white, enlisted men in this first term of enlistment at the beginning of a 6-month overseas deployment. The independent measures consisted of the previous Quarterly Performance Marks given to the individual. These included ratings of 1) professional performance, 2) military behavior, 3) military appearance, and 4) adaptability. In addition, both Promotion Rate and the number of demotions, were used to predict actual reenlistment. The criterion had three categories 1) recommended for reenlistment and did reenlist; 2) recommended but did not reenlist; 3) not recommended or prematurely discharged. The results of a step-wise Discriminant Analysis found 8 variables that accounted for a total of 34.7% of the variance. Military behavior and demotions accounted for 12.3% and 8.5% of the variance, respectively. Promotion rate accounted for 7.8% of the variance; number of times expelled from school accounted for 6.2% of the variance. Reenlistment was best predicted by those individuals with the best military behavior, lowest demotions, highest promotion rate, and lowest times expelled from school.

Performance related to Intentions/Attitudes Toward Reenlistment

Holz and Schreiber (1977) obtained data on 460 first term and 236 non-first term Army true volunteers. The performance data consisted of self reported pre-service delinquency and Army disciplinary/performance measures correlated with expressed career intentions. The results of the correlation analysis indicated that all the significant disciplinary performance measures were negatively related to career intentions. Specifically for first term enlisted personnel, the following Delinquency/Discipline performance measures were negatively related to Army Career Intentions: minor pre-service delin-

quency index ($r^2 = .036$); number of times AWOL ($r^2 = .019$); number of Article 15's ($r^2 = .029$); and number of rank reductions ($r^2 = .029$). For the nonfirst term enlisted sample, the following performance measures were also negatively related to expressed career intentions: number of school suspensions ($r^2 = .029$); minor pre-service delinquency index ($r^2 = .063$); and major pre-service delinquency index ($r^2 = .044$). The number of commendations was positively related to career intentions for the non-first term sample and was also the best performance predictor of the group ($r^2 = .144$). The total regression equation accounted for 30% of the variance. No performance predictors were in the equation. The non-first term sample total regression equation accounted for 38% of the variance in reenlistment intention. In this equation, the number of commendations was the only performance variable and it accounted for 3% of the variance.

Performance Related to Recommendation for Reenlistment

Plag (1969) was previously reviewed several times in this report. Several performance measures were obtained at each stage. The following significant findings were reported: the number of expulsions from school were negatively related to the effectiveness criterion at Stages A, B, and D ($r^2 = .015, .017, .007$), respectively, but positively related at Stage C ($r^2 = .015$). Number of arrests and weekly test scores were positively related to the criterion ($r^2 = .002$ and $.008$, respectively) at Stage C only. Ratings by the division officer, pay grade, and the semi-annual marks were positively related to the criterion at Stage D ($r^2 = .019, .02$, and $.018$, respectively). Fleet disciplinary action was negatively related only at Stage D ($r^2 = .015$).

Performance Related to Criteria Unrelated to Withdrawal

Plag et al. (1969) used an effectiveness measure as the criterion in a sample of 11,000 sailors and 13,000 Marines. The results of the correlation analysis for the Category IV Marines found the number of arrests and number of expulsions were negatively related to the criterion. Conduct and proficiency marks, pay grade, semi-annual marks, and more favorable division officer ratings were also lower than for average Marines. The Category IV Marines also had more disciplinary actions taken against them ("office hours" and "court-martials") than did the average. The regression analysis accounted for 9.6% of the variance in performance.

Summary-Performance

Performance variables, which include both performance before entry into the service, and performance while in the service, appear to add a small amount to prediction of the criteria reviewed in this section. Refer to Table 11 for a summary of results. The research results indicate that performance is a predictor of the specified criteria. However, the amount of variance accounted for is relatively small.

TABLE 11
PERFORMANCE VARIABLES

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
1. Ratings of professional performance; 2. Ratings of Military Behavior 3. Military Appearance; 4. Adaptability; 5. Promotion Rate; 6. Number of demotions	La Rocco et al (1975)	707 white Navy enlisted	actual reenlistment	Total $R^2 = .347$ (8 variables) 2. Military behavior $R^2 = .123$. 6. Demotions $R^2 = .085$ 5. Promotion rate $R^2 = .078$. Times expelled from school $R^2 = .062$ (civilian performance).
1. Self reported pre- service delinquency 2. Army disciplinary performance	Holz and Schreiber (1977)	460 first term 236 later term Army volunteers	Reenlistment intentions	All significant disciplinary performance measures were negatively related to career intentions regardless of term of enlistment. First Termers: (negative relationships) minor pre-service delinquency index ($r^2 = .036$); number of times AMOL ($r^2 = .019$); number of article 15s ($r^2 = .029$); number of rank reductions ($r^2 = .029$) Late Termers: Number of school suspensions ($r^2 = .029$) minors pre-service delinquency index 116

Table 11 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Holz & Schreiber (cont.)			$(r^2 = .063)$; major pre-service delinquency index $(r^2 = .044)$; (positive relationships) number of commendations $(r^2 = .144)$; total $R^2 = .30$ (three variables, first termers); Total $R^2 = .38$ (5 variables, 1 later termers).
1. Performance variables	Plag (1969)	3630 Navy Recruits	Recommendation for reenlistment	Expulsions from school was negatively related to criterion at stages A, $r^2 = .015$ B, $r^2 = .017$ D, $r^2 = .007$
			Positively related at Stage C	number of expulsions $(r^2 = .015)$ number of arrests $(r^2 = .002)$ week test scores ($r^2 = .008$)
			Positively related at Stage D:	Ratings by division officer ($r^2 = .019$) pay grade ($r^2 = .02$) semi-annual marks ($r^2 = .018$)

Table 11 (Cont.)

PREDICTOR(S)	AUTHOR(S)	SAMPLE	CRITERIA	FINDINGS OR RELATIONSHIP
	Plag (1969) (cont.)			<u>Negatively related</u> <u>at Staged:</u> <u>Fleet disciplinary</u> <u>action ($r^2 = .015$).</u>
1. Performance variables	Plag et al (1968)	11,000 Navy and 13,000 Marine enlisted.	effectiveness	Number of arrests and number of expulsions were negatively related to the criterion for the Category IV Marines. Conduct proficiency marks, pay grade, semi-average marks, and division officers ratings were lower in Category IV than for average marines. Category IV marines had more disciplinary actions Total $R^2 = .096$ (4 variables)

Conclusions of the Literature Review

Seventy six military studies were reviewed that dealt with the enlistment, reenlistment, and/or withdrawal process. An attempt was made to evaluate critically the contribution of the research to a meaningful understanding of the various processes.

Because of the large sample sizes normally used in military research, statistical significance was ignored. In place of statistical significance, the "amount of variance accounted for" was chosen as the evaluation criterion. This criterion is appropriate because it gives a meaningful indication of the predictability of the results of the various studies. As an example of the disparity between "statistical significance" and "amount of variance accounted for," readers may look through many of the studies and find that a predictor is statistically significant and yet account for a very small percent of the variance. Individuals in the military services who are required to make or implement policy decisions based on research studies need to know the most likely effect of their decisions. It is the contention of this review that the "amount of variance accounted for" best provides this information.

Eleven categories of independent variables were evaluated - economic/incentives, organization practices, organization climate, job content, satisfaction, intentions, expectations, demographic/biographic, psychological, aptitude, and performance. Within each of the eleven categories, variations existed in the specific definitions of the topic by the researcher(s). However, the classification system was broad enough that each study was able to be classified. Many of the studies appeared in several of the categories.

For this reason, when possible, the amount of variance accounted for was stated not only for the total study, but also for the specific category of independent variable.

Research is appropriate for establishing policy and subsequent decisions under two conditions: adequate research design and a substantial amount of variance accounted for in a meaningful dependent variable.

Throughout the literature review, evaluations were made of many of the research methodologies. One of the basic conclusions of this study and in summary of the individual methodological critiques, future researchers are urged to evaluate critically research design. Specific attention should be given to sample representativeness and/or stratified random samples, the inclusion of behavioral measures, the use of longitudinal designs, the inclusion of meaningful performance variables, the development and use of standardized and validated attitude measures, and the use of appropriate and meaningful multi-variate statistics. Careful attention should be focused on meeting the assumptions of each statistical test. In addition, it is recommended that future researchers provide "Management Summary" sections in which the "actual" results of the study are stated in terms understandable to potential users of the study.

When the research design is adequate, potential users of the research may make decisions not only on studies that account for a high percent of the variance, but also studies that account for minimal variance. Under these conditions, failure of studies to predict should be considered as equally acceptable evidence of meaningful research. Future research can be built on both predictive and non-predictive studies - but only when the research design is acceptable.

With the exception of the Economic/Incentive category, the remaining independent variables accounted for small amounts of variance. The second basic conclusion of this study is that the enlistment, reenlistment, and/or withdrawal process is clearly multi-variate in nature. That is, it is unlikely that variables representing any one of the remaining ten categories will account for a substantial amount of variance by itself. Therefore, the need is to include the broadest possible spectrum of predictors to increase the amount of variance accounted for.

The third basic conclusion of this paper is that the bulk of the research has omitted two significant classes of predictors. The first class is data essentially beyond the control of the military services, but which appear to be important predictors. Included in this group are the size of the population suitable for military accession, the current and/or projected unemployment rate among this population, and the ratio of military wages to civilian wages for specific specialties. With a few exceptions, studies using the preceding data did not also include the ten remaining categories of predictors. The second basic class of predictor which was entirely omitted from the research studies reviewed was that of the Separation Policies of the Department of Defense, as embodied in DOD directive #1332.14, and subsequently reflected in the corresponding policies of the Army, Navy, Air Force, and Marine Corps. Inasmuch as these policies most likely represent a major source of variance, inclusion in future studies should be mandatory.

The fourth basic conclusion of this study is that the bulk of the studies do not deal with dependent variables of primary interest to the military services. An analysis of Figure 1 discloses that more than half of the studies were not related to the Original Choice to enter the military

services, attrition prior to completion of obligated service, or actual reenlistment. Greater emphasis should be placed on research studies in the preceding three categories.

Past research provides a meaningful door for future research. The purpose of this critical analysis of past research is to attempt to provide guidelines for building on both the strengths and weaknesses of previous studies. Research, like technology, builds slowly on the foundations of previous successes and failures. Without success, there is no progress! Without failure, there is no progress! This paper is respectfully dedicated to building a meaningful bridge to assist future military researchers to provide the research so vitally necessary to the effective management of the military services.

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February 13, 1978

TO: Recipients of "Military Enlistment, Reenlistment, and
Withdrawal Research: A Critical Review of the Literature."

FROM: Herbert H. Hand
Professor of Management

Due to the late addition of several references, the numbering
system used in Figure 1 (Page 4A) of the referenced Technical Report
is out of sequence.

Please substitute the enclosed revised Figure 1 in your copy
of the report.

AD-A048955

Figure 1 (Revised)

CLASSIFICATION MATRIX FOR MILITARY
WITHDRAWAL STUDIES

Independent Variables Dependent Variables	Economic and/or Incentives	Organization Practices	Climate	Job Content	Attitudes and Satisfaction	Intentions	Expectations	Demographic and/or Biographic	Psychological variables	Aptitude scores	Performance
Original Choice	2, 19, 25, 34, 35, 46, 61	23	23			72	23	23			
Attrition Prior to Completion of Obligated Service		27, 31	55	55			55	3, 27, 28, 30, 48, 50, 51, 54, 55, 63, 67,	79	28, 50, 54, 63,	
Actual Reenlistment	16, 33, 45, 49, 55, 56, 58, 66		12, 58, 73	26, 32, 49, 66, 74	12, 26, 47, 74	1		18, 26, 28, 32, 47, 49, 58, 56		28	47
Intention or Attitude Toward Reenlistment	13, 20, 22, 23, 37, 60, 69, 73	4, 13, 22, 23	4, 8, 13, 16, 22, 39, 59, 60, 69	16, 55, 59, 60	8, 13, 16, 73		23, 69	37, 39, 59, 73			39
Completion of First Term and Recommended for Reenlistment	62		62					62, 68		62, 68	62
Other Forms of Withdrawal								17, 48	17, 48		
Studies Unre- lated to With- drawal Behavior	40, 44				5, 6, 9, 14, 15, 24, 36, 43, 44, 57		5, 44	24, 36, 64		5	64

Numbers in the various cells of the Classification Matrix refer to numbered studies in the Reference Section.