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ABSTRACT

The relationship between servicemembers' participation in the U.S. Armed Forces' off-duty voluntary higher education programs and retention of enlisted personnel in military service was examined through a review of existing and new data. The primary data source was a 1992 Department of Defense-sponsored survey of a stratified sample of approximately 32,000 active duty servicemembers and 8,000 military spouses. The survey data were subjected to univariate and multivariate analyses. Additional data were collected through semistructured interviews with a sample of 31 men and women from the Army and Air Force who were participants in the voluntary education program. The quantitative data analysis supported the hypothesis that long-term participation in off-duty education is significantly related to intention to reenlist. When several other variables were considered, however, the overall effect of participation in off-duty education proved to be very small. A fundamental change in the relationship between off-duty education and retention during the past 10-15 years was discovered. It was concluded that the value placed on servicemembers' educational participation has become so embedded within the military environment that the effect of educational participation may be masked by other variables, such as satisfaction with the military way of life. (Contains 24 references) (MN)

United States Armed Forces' Voluntary Education Program:

The Effect On Enlisted Servicemember Retention

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Abstract

The United States Armed Forces have sponsored off-duty voluntary higher education programs for fifty years. The investment in these programs by the Armed Services is substantial. In 1997, Department of Defense (DOD) expenditures for voluntary education programs totaled $208 million. The longevity and scope of these military programs make them an ideal special case through which to study the outcomes of employer sponsored off-duty education. This study looked at the relationship between participation in military sponsored off-duty education programs and enlisted retention in the service. The data for the study was from a large (60,000 respondents) survey conducted by the DOD in 1992. Both univariate and multivariate statistical analysis techniques were used. Additionally, over thirty semi-structured interviews were conducted with service members. The quantitative analysis supports the conclusion that long-term participation in off-duty education is significantly and positively related to intention to reenlist in simple bivariate models. However, when several other variables thought to be related to retention are controlled the overall education participation effect is very small, accounting for little of the variation in intention to reenlist. A comparison of the education participation pattern in this data with previous studies leads to the conclusion that there has been a fundamental change in the relationship between off-duty education and retention in the last ten to fifteen years. The qualitative data suggest that the military places a high value on educational participation exhibited in formal and informal policies, the organizational reward system, promotions and attitudes. The opportunity to participate varies by location, specific job and military specialty. Servicemembers' attitudes toward education appear to evolve. Early participation seems to be extrinsically motivated with an intrinsic motivation developing as the servicemember continues to participate. The quantitative and qualitative data support the conclusion that the military has changed in its view of educational participation. The data point to the conclusion that the military has adopted educational participation as an integral part of the military culture. This value is so embedded within the environment that the effect of educational participation may be masked by other variables such as satisfaction with the military way of life.

INTRODUCTION

The United States' Armed Forces have been involved in employer sponsored off-duty education for over fifty years. The services have provided tuition assistance (TA) to servicemembers and formed cooperative arrangements with public and private institutions of higher education to meet the special needs of the military member (Anderson, 1991; Rose, 1974). In addition to the TA that provides the financial opportunity for the service member to attend college, the services have actively brought educational opportunities to the service member. A system of on-base educational programs delivered by public and private institutions of higher education has been developed to meet the special needs of the military member. Collectively, this system is called the Voluntary Education Program. This system is substantial in size and scope. In fiscal year 1997 (FY 97) the Voluntary Education Program accounted for 650,000 enrollments, over 33,000 degrees and $208 million in expenditures (DANTES, 1998).

The military has historically viewed the Voluntary Education Program as a tool for recruiting and retention. Although the "value" of education is widely accepted by the military education community and the senior leadership, as competition for funds becomes intense within the Department of Defense, the question becomes, how valuable? Senior policymakers demand more evidence that sponsorship of off-duty voluntary education programs is beneficial to the military service. Professional educators in the military system have recently been seeking evidence of the benefits to the service of off-duty educational programs so that they can defend the voluntary education programs. The need for research on the organizational benefits of off-duty educational programs is acute.

With the end of the draft and the inception of the All Volunteer Force (AVF) in 1972, off-duty education programs were seen as inducements to recruiting and retention. As the

services, the Army in particular, experienced difficulty in meeting their goals for high quality recruits, extensive research was done on the effect of service sponsored education programs on recruitment (Boesel & Johnson, 1984; Polich et al., 1982; Congress of the U.S. 1982; Fernandez, 1980; Fernandez, 1982; Congress of the U.S. 1980; Buddin, 1991; Boesel & Johnson, 1983; Ramsberger, 1993). The relationship between recruitment and military sponsored education programs is well established and accepted as effective by both the armed services and Congress.

The issue of retention has received much less attention. Retention of servicemembers is a high priority endeavor because of the critical nature of staffing shortages and the large investment in terms of time and money needed to recruit and train servicemembers. The existing literature on the subject of off-duty participation and service retention is sparse and describes mixed results. The importance placed on retention as a goal of the military services and the less than exhaustive literature on the relationship between retention and participation in off-duty education makes it an attractive research target.

In an attempt to provide to fill this void in the literature of military voluntary education a study was conducted that explored the relationship between participation in off-duty voluntary education and retention of enlisted servicemembers in the armed forces. This paper is a very brief summary of the key findings of that study. The limitations of time and space necessitate that only the barest essentials of the relevant literature and the methodology used be detailed here. The reader is encouraged to review a complete discussion of these components in Brauchle (1997).

The central hypothesis of the study was that participation in off-duty education is positively related to enlisted retention within the services. The study looked at the relationship between participation in military sponsored off-duty education programs and retention in the

service for sub-groups identified by education level, job satisfaction as well as several demographic factors. As the study was designed the following research questions arose:

1. Is participation is the Military Voluntary Education Programs positively related to enlisted retention in the armed services?
2. What are the characteristics of those who participate in the military voluntary education program?
3. Is the relationship between participation in the military voluntary education program and retention different for sub-groups, as suggested by the adult education literature and the subjective opinion of practitioners?
4. Do the patterns of the existing relationship between participation in the military voluntary education program and retention suggest sub-groups or differentiation not predicted in the literature?
5. If participation in military voluntary education programs and retention are related for sub-groups not suggested in the literature, what theory or mechanism is involved?

RELEVANT LITERATURE

The literature on the connection between participation in voluntary education programs and retention in the service is not extensive and reveals mixed conclusions. In a limited study of Navy voluntary education programs, participation was found to be negatively related to stated intentions to re-enlist and in actual reenlistments (Githens et al., 1977).

A more recent survey of Air Force personnel (Alley et al., 1995) found that 72% of the respondents agreed or strongly agreed with the statement that the tuition assistance program improves the retention of quality personnel. Forty percent of those responding to the same

survey stated that educational opportunities were a major reason they stayed in the military (Alley et al., 1995). While this study provides some evidence that Air Force personnel value educational programs highly, the sample used in the survey and the limited statistical analysis provided preclude any conclusions about the association between participation in off-duty education and retention.

A Navy study of Tuition Assistance (TA) users revealed that "Fifty-nine percent of TA users said that the availability of TA was an important factor in their decision to reenlist in the Navy. Thirty-nine percent of TA users said that the availability of TA was the deciding factor in their decision to reenlist in the Navy" (Green et al., 1988, p.25). Again, the sample is small and the sampling methods less than ideal. The study reported only the respondents' opinion of the importance of TA in their reenlistment decision. No data are provided on comparative reenlistment rates for TA users and non-users.

All three of the previous studies dealt with only one service and only those servicemembers participating in voluntary education programs while using tuition assistance. Those servicemembers paying tuition out of their own pocket, using GI Bill benefits or other funding such as Pell grants are not addressed.

The largest and most comprehensive study of participation in off-duty education was conducted in 1988, *The DOD Tuition Assistance Program: Participation and Outcomes* (Boesel & Johnson, 1988). The primary focus of the study was users of Tuition Assistance. The study included Army, Air Force and Navy servicemembers. Survey data were combined with a review of the individuals' military education records as well as selected personnel data from military computer records. The large sample size and multiple data sources make this a particularly

robust study. The study found a strong positive relationship between retention in the service and participation in the TA program (Boesel & Johnson. 1988).

Two different measures were used. One measure used survey data to compare TA users' and non-users' responses to a question about reenlistment intentions. Overall, TA non-users were nearly twice as likely to say they "plan to leave the military" (Boesel & Johnson, 1988, p.36). The study did reveal large differences between services on this question, however. Army TA non-users were two and one-half times more likely to say they were leaving while the Navy respondents indicated almost no difference between users and non-users.

Another measure used in this study was a logistic regression analysis of several factors widely thought to be related to retention in the service, along with TA participation and actual retention data. The analysis revealed that "enlisted participation in the Tuition Assistance program (TAPART) is strongly and significantly associated with retention after all the other variables in this analysis are taken into account." (Boesel & Johnson, 1988, p.B-7) "Participating in Tuition Assistance roughly doubles the ratio of the probability of staying in the military to the probability of leaving" (p.42).

Boesel and Johnson also analyzed data from the National Longitudinal Survey of Youth Labor Market Experience. This is a widely used large-scale longitudinal study. One of the questions this survey asks of those respondents in the military service is "During your service in the (Branch) did you take any courses for which you received high school or college credit" (Boesel & Johnson, 1988, p.A-1)? Boesel and Johnson used a positive response to this question as a proxy for off-duty voluntary education participation. The relationship between intention to reenlist and participation in off-duty voluntary education was analyzed. The analysis found "in the NLS analysis there is no perceptible relationship between the reenlistment intentions of

participants and non-participants in voluntary education" (p. A-7). This is contrary to their finding with their own data. The authors attribute the differences to substantial differences in the sample in terms of time and composition. The analysis of the NLS data also showed significant differences in participation rates from the TA data that Boesel and Johnson gathered.

None of the studies cited addresses the findings of the others. One possible explanation for the differences is the time of the studies. The Githens and Wilcove study was done in 1976 just as the service was making a transition to the All Volunteer Force. Many of those on active duty were levered into the Navy by the draft. Additionally, this period is marked by extreme difficulty in meeting recruiting goals, particularly among high quality recruits. These factors, along with the small population and the less-than-ideal sampling methods used by Githens may contribute to the differences. The Boesel and Johnson (1988) study which included all services except the Marine Corps, was based on 1985 data and used scientific sampling methods. The NLS data set not withstanding, this study makes a compelling case for concluding that participation in off-duty education programs is positively related to service retention when other factors are controlled. The later Navy study by Green and Dunlap (1988) and the Air Force study by Alley, et al. (1995) support a strong positive relationship between TA and retention, at least for those who participate.

The Boesel and Johnson (1988) study and to a lesser extent Githens and Wilcove (1977) are the only ones cited above that controlled for other factors associated with retention when looking at the relationship between retention and voluntary education participation.

METHODOLOGY

As the resources available for the project were modest, existing data sources that might provide some of the needed information were sought. In 1992 the Department of Defense, through the

Defense Manpower Data Center (DMDC), conducted a survey of a large stratified sample of active duty servicemembers and their spouses. One survey instrument was administered to enlisted personnel, another survey to their spouses. The enlisted survey was administered to approximately 32,000 respondents, the spouse survey to approximately 8,000. The surveys contained approximately 150 questions, many with numerous parts. In all, each survey instrument had over 250 fields. These surveys contain detailed demographic data, questions on education participation, job satisfaction, civilian employment prospects, and intention to reenlist, amongst others.

Several things make these data attractive. The sample is very large so that even small effects can be detected. All services are represented. The data set contains answers to questions about education participation and numerous factors that might be related. As the data set is a newer version of the same survey data that Boesel and Johnson (1988) used for much of their analysis, a close approximation of some portions of their work could be replicated. The survey data set contains a 'couples' file that has matched responses of service members and their spouses. This allows exploring the relationship between education participation, retention and spousal attitudes toward the service and education.

The data set described above, hereafter to be called the DMDC data was analyzed using both bivariate and multivariate statistical techniques to explore the relationships that exist between participation in voluntary education programs, retention, and various other variables.

To answer the exploratory questions posed by this project, a qualitative segment was integrated into the plan. After the initial statistical work was completed on the DMDC data, a series of semi-structured interviews (n=31) were conducted with voluntary education participants at Eielson AFB and Ft. Wainwright Alaska. A mix of Air Force and Army, women and men

were interviewed. The focus of the interviews was to help provide insight to the possible meaning of the quantitative results of the initial investigation. While this sample is not large, it did allow a look at two different services and several other sub-groups.

Several tests were performed on the DMDC data. Regression analysis was performed on simple bivariate models of service retention and educational participation. A 'replicate' of the model tested by Boesel & Johnson (1988) was also tested using a stepwise multiple regression. Replicate is in quotes because some of the variables used by Boesel & Johnson were not available in the DMDC data set and proxies were substituted as I'll explain.

To provide a more complete model, a second stepwise regression analysis was performed using the variables listed above from the Boesel and Johnson replication attempt, plus the additional variables job satisfaction (JOBSAT), satisfaction with quality of military life (MILSAT) and the servicemembers' assessment of his or her chances of getting a good civilian job (JOBCH). In addition to the three variables above that were suggested by the literature on reenlistment, one other variable was added to this more complex model. That variable provided a measure of short-term participation in off-duty education. This dummy coded variable (SHRTPART) indicated whether the respondent had attended a civilian college during the previous year. The objective of adding this variable to the model was to explore if there were any differences in the effect upon retention between short and long-term education participation. As this model would serve as the basis for several additional tests, hereafter it will be referred to as the Complex Model.

Several hypotheses concerning sub-group relationships between retention and participation have been suggested by the literature and the judgment of practitioners. Several

testable hypotheses were developed concerning these sub-groups. Tests were formulated to look at education participation and retention among several sub-groups suggested by the literature.

The Couples data set allowed us the opportunity to look at the interrelationship between service retention and other factors associated with the military for both the military members and their spouses. Based on the existing literature several testable hypotheses for the Couples data set were developed.

In addition to the hypothesis testing detailed above, other statistical tools where used with the DMDC data. Several simple descriptive statistics also derived for the data. Additionally, by using several demographic variables, both continuous and dummy coded, in a logistic regression; profiles of sub-groups such as long-term participants in off-duty education were obtained.

Before discussing the results of the tests some of the key variables need to be defined. Ideally, a long-term longitudinal study would be used to determine service retention. In fact, the largest previous study of retention and education participation used just such a method (Boesel & Johnson, 1988). Such a study was, however, beyond the time or resources available for this research.

The DMDC data sets do contain a decent measure of retention, however. Previous studies (Chow et al., 1980) have shown that intention to reenlist is a good predictor of actual reenlistment behavior. One of the DMDC survey questions asked the respondents to rate the probability that they would reenlist. From this question a new variable 'REUP' was derived on an ordinal scale of 0 to 10 with 0 representing 0% chance of re-enlisting, 1 representing 10%, etc., up to 10 representing a 100% chance of re-enlisting.

Another important variable was needed to perform the desired analyses, a measure of participation in off-duty education. The DMDC data sets did contain a direct measure of

participation. One of the survey questions asked, "During 1991 did you attend a civilian school" (DOD, 1991, p.8)? As this question only addressed education participation during the previous year it was labeled short-term participation and coded as the zero/one variable SHRTPART for short-term participation.

Military assignments vary considerably from job-to-job and location-to-location. Some jobs might require long duty hours and frequent travel while others are less demanding. Likewise, some duty stations offer a multitude of educational opportunities because of their size or geographic location while others have scant educational offerings. For these, as well as personal reasons, an individual servicemember's participation in off-duty education can vary considerably over the period of a military career. With this in mind, a measure of long-term participation in off-duty education would be more appropriate for some of the analyses desired.

Unfortunately, the DMDC survey did not provide a direct measure of long-term participation. Several questions on the survey did provide information about the respondents' educational attainment. Of particular note are questions asking about education level at the time the respondent first entered the service and another question that asked for the same information at the time that the survey was completed. The available answers ranged from no high school diploma to doctoral degree

The objective was to find some measure of long-term participation in off-duty education. A new variable called LONGPART, for long-term participation, was created based on the responses to the questions about education level at entry (START) and at present (END). If the respondent showed an increase in education level and the ending level was at least 'some college', long-term participation (LONGPART) was coded 1. If the end education level was below 'some college' or the same as at entrance LONGPART was coded 0.

This definition of long-term participation certainly is not a perfect one. To be counted as participating, a service member must not only participate in off-duty education, but also raise his or her education level. Previous studies of the relationship between off-duty education and retention have used definitions of participation that typically required minimal levels of participation. The measure of long-term participation provided by the variable LONGPART is no less selective than the measures used in previous studies and in some cases, particularly those with some college, more restrictive.

FINDINGS

With some of the key variables defined, the initial analysis was performed using the regression technique. The quantitative work began with the testing of rather simple models using intent to reenlist (REUP) as the dependent variable and several different measures of education participation as the independent variables. The early results were encouraging. In simple models long-term participation (LONGPART) was strongly ($p=.0001$) and positively related to intent to reenlist, accounting for three percent ($R^2=.03$) of the variation in intent to reenlist.

A cautionary note is warranted concerning statistically significant effects found in the data analysis. The Member data set used for the complex models contained very large numbers of observations. While the actual number depended upon the specific variables contained in the model, most tests used 20,000 observations or more ($n>20,000$). Likewise with the Couples data set. This data set, while smaller, still contained in excess of 5000 observations ($n>5,000$). These large numbers allowed the measurement of very small effects. I have tried to separate the statistical significance of these effects from the practical significance of the effect as a predictive tool. Very small p-values indicate that there is a very small probability that the effect under test

is a result of randomness in the data. Practical effect is better measured by the amount of variation (R^2) in the dependent variable explained by the independent variable. In layman's terms, the low p-value tells us that the effect is real, there are differences. While a very small R^2 tells us that the differences we have measured are of little useful importance.

Based on the existing literature, several factors were thought to be related to reenlistment and hence intent to reenlist. For the relationship between participation in off-duty education and retention in the service to be meaningful, the effect of other known effects would have to be controlled. This obviously requires more complex models. Replicating the Boesel and Johnson (1988) model as closely as possible was chosen as a desirable starting point for testing the complex models. In addition to controlling the model for several factors thought to be related to service retention, this model would allow the DMDC data to be benchmarked against the Boesel and Johnson data.

The Boesel and Johnson study (1988) explored the relationship between participation in voluntary education programs and retention while controlling for several other factors thought to be related to retention. Those factors are listed in table 1. Most of the same factors are available in the DMDC data set. The exceptions are Tuition Assistance participation, time-in-grade, Armed Forces Qualifying Test (AFQT) category and actual retention data. Lack of these variables precluded duplicating the test done by Boesel and Johnson.

The DMDC study does contain proxies for three of the variables, however. The (LONGPART) variable most closely matches Boesel and Johnson's (1988) (TAPART) as both count education participation at any point in the servicemember's career. AFQT score, one of the variables not available in the DMDC data set, is a general measure of verbal and math aptitude. In the Boesel and Johnson study (1988), education level was not significantly related to retention

when controlling for AFQT. They suggest that both may measure the same construct. (Boesel & Johnson, 1988, B-8). Education level at the time of entering the service (START) may serve as a crude proxy for AFQT. The (START) variable was chosen as the closest proxy for AFQT score.

Table 1

Variables used in Boesel and Johnson and DMDC Regressions

Factors Available	Boesel & Johnson	DMDC Data	Type Variable
Long-term participation in off-duty education *	TAPART	LONGPART	Dummy
Retention in service or intent to remain *	ACTIVE	REUP	Contin
Sex	SEX	MALE	Dummy
Black	BLACK	BLACK	Dummy
White	WHITE	WHITE	Dummy
Marital Status	MARR	MARR	Dummy
General Mental Aptitude at Service Entrance * (AFQT score)	CAT1-2 & CAT3***	START	Contin
Education Level	ED	END	Contin
Army	ARMY	ARMY	Dummy
Navy	NAVY	NAVY	Dummy
Military Pay Grade (rank)	PGRADE	PGRADE	Contin
Total Active Military Service Time	TAFMS	TAFMS	Contin
Time in present grade **	TIMEGRDE	N/A	Contin
Enlistment period (1,2,3, etc.)	ENLPER	ENLPER	Contin
Time left in current enlistment	TIMELFT	TIMELFT	Contin

Note: * Indicates a proxy variable that is different between the two tests.
** Variable not available or proxied in one data set.
*** CAT1-2 & CAT3 are Dummy variables

The other variable used by Boesel and Johnson (1988) that is not available in the DMDC data is time-in-grade, how long the service member has been in his or her present pay grade. Unfortunately, the DMDC data does not contain any proxy for time-in-grade. The last and very important variable missing from the DMDC data is actual retention data. Intent to remain in the service is a widely accepted measure of actual retention that has been shown to be valid in numerous studies (Boesel & Johnson. 1984) and is available in the DMDC data set as the variable REUP.

The first complex model to be tested was the model used to replicate as closely as possible the Boesel and Johnson (1988) model. An ordinary least squares regression using the stepwise procedure was run using the variables listed in table 1 as independent variables and intent to reenlist (REUP) as the dependent variable. The results of the regression were largely the same as Boesel and Johnson with a couple of highly notable exceptions. Of the 13 variables (out of 14) that were duplicated or proxied, 10 were statistically significant in both models. Of these 10, all but 2 (Total Federal Active Military Service and Mental Category (AFQT)) had coefficients in the same direction and most were of similar magnitude in terms of relative effect upon the dependent variable reenlistment (see table 2).

Of the top four factors accounting for differences in reenlistment behavior in the Boesel and Johnson model, the DMDC data yielded 3 of the same factors in the same relative relationship. The very notable exception is participation in off-duty education. The Boesel study found that use of TA as a measure of participation in off-duty education accounted for more of the variation in reenlistment activity than any other factor in the model. The DMDC data gave much different results. While participation in off-duty education, measured by a change of education level to at least some college, is positively related to reenlistment at a significant level, p= .0001, the amount of variation that it accounts for when all other factors are in the model is very small, R^2=. 0002. In other words, although the relationship between reenlistment intention and long-term education participation is statistically significant, it appears of to be of little practical significance. In the DMDC data, the first three factors accounted for 96.6% of the variation explained by the model.

The one factor that seems to behave most differently in the two models is long-term participation in off-duty education. One possibility that cannot be overlooked is the difference in

the definition of participation used in the two models. While the effect of the differences in the definitions of the education participation variables between the DMDC and the Boesel and Johnson (1988) data could be debated, the argument centers on nuances of the measure not the construct being measured. The change in the relationship between participation in off-duty education and retention in the service in the two models is a profound one, well beyond minor differences in the method used to measure the construct. The question that remains is why has the importance of participation in off-duty education decreased in relation to reenlistment?

Table 2

Comparison of Significant * Factors in 1985 & 1992 Models

DMDC Data 1992			Boesel and Johnson 1985		
Variable	Partial R^2	Coefficient	Variable	Odds Ratio	Coefficient
PGRADE	0.1719	Pos	TAPART	1.94	Pos
TIMELEFT	0.516	Pos	PGRADE	1.78	Pos
MARR	0.0134	Pos	TIMELFT	1.76	Pos
ARMY	0.0047	Neg	MARR	1.62	Pos
ENLPER	0.0022	Pos	ENLPER	1.36	Pos
BLACK	0.0006	Pos	SEX	1.12	Pos
TAFMS	0.0004	Pos	TIMEGRDE	1.01	Pos
LONGPART	0.0002	Pos	TAFMS	0.98	Neg
START	0.0002	Pos	CAT 1-2	0.89	Neg
END	0.0009	Neg	NAVY	0.78	Neg
NAVY	0.0001	Neg	WHITE	0.63	Neg
			ARMY	0.56	Neg

* $p < .05$

The literature on military service retention suggests there are several other variables that may be related to retention which Boesel and Johnson didn't include in their logistic regression analysis. The DMDC data contains several questions that allow controlling for these variables.

A more complex and complete model of differences in retention (REUP) was tested. This model included other variables that are thought to be related to reenlistment, such as satisfaction with your job and the military way life as well as the prospects for employment in the civilian world. Indeed, when these factors were added to the model and a stepwise regression performed the model had significantly more predictive power. While the replicate of the Boesel and Johnson (1988) model accounted for approximately 25% of the variation in intent to reenlist (adjusted $R^2 = .2458$), the complex model accounted for nearly 41% of the variation in reenlistment intention (adjusted $R^2 = .4084$). The three variables added to the model were all among the six factors most strongly related to reenlistment (see table 3). The best predictor in the model was overall satisfaction with the military way of life (MILSAT) accounting for over 26% ($R^2 = .2628$) of the variation in intent to reenlist, more than the entire Boesel and Johnson model. While long-term participation in off-duty education (LONGPART) remained positively and weakly ($p=0.0784$) related to reenlistment, the practical effect upon intent to reenlist was negligible as it accounted for only one one-hundredth of one percent of the variation in the dependent variable REUP ($R^2 = .0001$).

The other interesting result this model produced was the effect upon reenlistment associated with short-term participation in off-duty education (SHRTPART). The model showed short-term participation to be significantly ($p=0.0185$) and negatively related to intent to reenlist. Again, the practical effect of this relationship is very inconsequential as short-term participation accounted for only one one-hundredth of one percent of the variation in the dependent variable REUP ($R^2 = .0001$). The difference in the direction of the effect between long and short-term participation may be explained by those who plan to leave the service soon taking advantage of the opportunity to receive financial assistance and prepare for the civilian job market in greater

numbers than those who intend to remain in the service for a longer period of time and thus don't feel the need to participate in the short term.

Table 3
Results of Stepwise Regression on Complex Model

Variable	Partial R2	Model R2	Coefficient	F	Prob>F
MILSAT	0.2628	0.2628	Pos	8365.3	0.0001
PGRADE	0.0875	0.3502	Pos	3160.2	0.0001
TIMELEFT	0.0253	0.3757	Pos	951.6	0.0001
JOBCH	0.0118	0.3875	Neg	450.6	0.0001
MARR	0.0105	0.398	Pos	410.7	0.0001
JOBSAT	0.0036	0.4016	Pos	142	0.0001
NAVY	0.0013	0.403	Pos	51.8	0.0001
USAF	0.0028	0.4057	Pos	110.2	0.0001
ENLPER	0.0008	0.4065	Pos	30.7	0.0001
BLACK	0.0005	0.407	Pos	18.6	0.0001
MALE	0.0006	0.4076	Pos	23.9	0.0001
TAFMS	0.0002	0.4077	Pos	6.1	0.0139
SHRTPART	0.0001	0.4079	Neg	5.5	0.0185
INDIAN	0.0001	0.408	Neg	5.2	0.0228
LONGPART	0.0001	0.4081	Pos	3.1	0.0784
END	0.0001	0.4082	Neg	4	0.0463
START	0.0007	0.4089	Pos	28.1	0.0001

In terms of the results hypothesized, the initial results with the model intended to replicate Boesel and Johnson (1988) and the complex model were surprising. In hopes of providing more insight to the results, profiles of education participants were developed. To obtain a profile that controlled for factors related to retention, a logistic regression was performed using participation as the dependent variable and all of the variables from the complex model as the independent variables. This provided a good mix of demographic and attitudinal variables for the profile. Two separate logistic regressions were performed, one using the dummy variable for short-term participation (SHRTPART) and one using the dummy variable

for long-term participation (LONGPART) as the dependent variable. Sixteen of the seventeen independent variables in each model were statistically significant at $p \subseteq 0.0033$

The results of the logistic regressions of the model for both short and long-term participants are contained in table 4. The odds ratio shows the effect of each independent variable upon the dependent variable. By analyzing the odds ratio we find we can draw the following conclusions about the short-term participant in off-duty education: Females are more likely to participate than males by nearly 1.5 to 1. When we look at the effect of race we find that blacks are the group most likely to participate, followed by whites, who participate slightly more often than the omitted group 'other'. The single service member is more likely to participate than a married one. The higher the level of education of the service member the more likely he or she will be a short-term participant. A look at service affiliation reveals that the Army has the highest participation rates followed by the Air Force (the omitted group) and trailed significantly by the Navy and the Marines. The ship board deployments of Navy and Marine personnel are one possible explanation for the lower short-term education participation rates of these service members.

Several other demographic variables effect participation rates as well. The higher the pay grade and later the enlistment period the service member is serving, the lower the probability that he or she is a short-term participant. A factor that comes into play is the propensity of those most likely to leave the service to participate in higher numbers. It is possible that those who have decided to leave the service are more likely to take advantage of the educational opportunities before they depart. As those in the lowest grades and the earliest enlistments are the most likely to leave the service it would follow that they would participate in greater numbers. A short-term

participant is likely to be more satisfied with both his or her job and the military way of life and have a higher expectation of good civilian employment.

The long-term participant has many of the same characteristics and some different ones. Again, females are more likely to participate. Both blacks and whites are more likely to participate in off-duty education over the long term than the omitted group 'other,' but whites are slightly more likely to participate than blacks, a reversal from short-term participation. Over the long-term married members are more likely to participate than single ones.

Table 4

Results of Short & Long-term Participation Profile

Variable	Short-term (SHRTPART) Odds Ratio	Long-term (LONGPART) Odds Ratio
MALE	0.683	0.687
WHITE	1.027	1.195
BLACK	1.138	1.115
MARR	0.896	1.163
END (education level)	1.648	Not Significant
START (education level)	Not Significant	0.21
ARMY	1.159	0.487
NAVY	0.729	0.246
MARINE	0.704	0.282
PGrade (Pay Grade)	0.922	1.762
TAFMS (Time in Service)	1	1
ENLPER (enlistment period)	0.854	1.313
TIMELEFT (on enlistment)	1.037	0.979
JOBSAT	1.019	0.973
MILSAT	1.039	1.011
LONGPART	3.889	Not Applicable
SHRTPART	Not Applicable	7.066
JOBCH (employability)	1.02	1.034

When we look at the effect of service affiliation there is another change from short-term participation patterns. Air Force personnel are significantly more likely to be a long-term participant than Army personnel. The Marines and Navy follow a very distant third and fourth. The surprising factor here is the reversal of the Army and Air Force participation rates from short-term to long-term participation measures.

Pay grade and enlistment period are strongly related to long-term participation as would be expected. Both of these factors are to some degree a measure of longevity in the service. It follows that the longer one is in the service the more opportunities one has had to improve one's education level and thus be counted as a long-term participant. Service members who are long-term participants in off-duty education are more satisfied with the military way of life and have higher expectations of civilian employment. Although satisfied with the military way of life, long-term participants do report slightly lower job satisfaction. This parallels the early finding that the connection between job satisfaction and satisfaction with the military way of life is weaker for long-term participants.

The last observation that emerged from the two profiles of the participants is the strong connection between long and short-term participants. It is not surprising that a short-term participant is nearly four times as likely to be a long-term participant as long-term participation would require short-term participation. What is enlightening is that a long-term participant is seven times as likely to be participating in the short term than is someone who has not raised his or her education level. This supports the observation that military members who raise their educational attainment while in the military continue to participate in educational activities at higher levels than those who have not raised their educational attainment do.

The testable hypotheses that had been developed around sub-group behaviors were tested next. Space doesn't allow a detailed discussion of each of the tests performed on the sub-group behaviors. As the results of the tests might shed light on the central question of the connection between participation in voluntary education and retention, a summary of the results is provided in table 5.

With the exceptions noted in table 5, the sub-group relationships between participation in off-duty education and reenlistment were largely as hypothesized from the existing literature on adult education. While these relationships often had convincing statistical significance, none of them were of much practical value as they had very little predictive power when other factors in the model were accounted for. Specifically, overall satisfaction with the military way of life and military pay grade accounted for the bulk of the predictive power of the models tested.

Table 5
Summary of tested hypotheses and the results.

Hypothesis	Result
The retention rates are higher for more highly educated service members if they participate in the voluntary education program.	Reject
The effect of participation in voluntary education on retention rates of those enlisted members with some college but no degree will be greater than for those with no college or a baccalaureate.	Reject
Retention rates are higher among those who want to participate in off-duty education even if they don't participate.	Accept
Among Servicemembers with a similar education level, those who participate or want to participate in the voluntary education program are more likely to stay in the service than those not interested in the program.	Accept * * below AA.
Among those who report low job satisfaction, retention rates are higher for those who participate in adult education.	Accept
Participation in the voluntary education program for those who report low job satisfaction increases satisfaction with the military way of life compared to those who are dissatisfied with their job who cannot participate in the voluntary education program.	Accept

A military member's satisfaction with his or her opportunities for education and training effects that member's overall satisfaction with the military way of life.	Accept
Military members whose spouses support them staying in the service are more likely to intend to stay in the service.	Accept
The spouses who are most satisfied with the military way of life are more likely to support the military member remaining in the service.	Accept
There is a positive relationship between the quality of the educational opportunities available for the military spouse and the spouse's support of the member staying in the service.	Reject
The spouse of a service member who participates in the voluntary education program is more supportive of that member staying in the service.	Accept
Spouses who participate in education are more likely to support the service member's staying in the service.	Reject
The spouse's satisfaction with his or her opportunities for education and training effects that spouse's overall satisfaction with the military way of life.	Accept

While the qualitative data that the interviews yielded cannot be generalized too widely. It might prove useful in interpreting the results of the quantitative data. A short summary of the key findings that emerged is provided. As already detailed, 31 semi-structured interviews were conducted to determine the attitudes of at least some military participants in off-duty education programs. Several themes emerged that were particularly relevant to the questions under study.

One of the first themes that became readily apparent is one of the most relevant to the research questions posed. Even before the tapes were transcribed and analyzed it became apparent that virtually everyone interviewed believed that the military service valued off-duty education. Of the thirty-one interviews conducted, 28 of the respondents were unequivocal in their belief in this view. The respondents as 'proof' of this view cited numerous examples. Many of those interviewed talked on this subject for several minutes. What struck me was the depth to which this educational value seemed to be present in the organization. Those interviewed provided ample evidence that the desirability of participating in off-duty education was an espoused value of both the Army and the Air Force. Perhaps even more telling than the

espoused values and organizational rewards that seemed to be attached to participation in education are the attitudes that were revealed by the interviews. Several NCOs expressed concern about keeping up with their troops or improving their education level to effectively perform their duties as they progressed in responsibility. Indeed, several expressed a commitment to education that went beyond a personal responsibility to improve their own educational attainment. They seemed to believe that it was their duty to help and encourage their subordinates to pursue education as well. Part of their role as an NCO was to spread the word to their charges.

Some portions of the interviews focused much more closely on the individual than on the organization. One area of interest was the individual motivation that the service members expressed for their involvement in off-duty education. Of the thirty-one service members interviewed, all but three or four of them related stories that exhibited significant and evolutionary changes in their educational goals and desires.

In many cases the impetus to begin school originates from an external source. The need for education to get promoted , encouragement from a superior, preparation for a job after separation, etc. were all cited. For many of those interviewed, once they began the educational journey, the process itself became the motivator. The transformation from external to internal motivation occurs frequently in this small sample. A strong commitment to high educational goals exists in most of the interviews. In the 31 interviews, 24 of the respondents expressed an educational goal of at least a master's degree and 17 specifically stated they believed in life-long learning and would continue to engage in some educational activity for the rest of their lives. For whatever reason many of those who start to participate in off-duty education really become turned-on to the educational experience

One theme was particularly interesting because of its relationship to off-duty education and retention. While not present in overwhelming numbers, the issue did arise several times in the small sample of interviews. Several of the respondents suggested that one of the reasons they reenlisted was because they had not yet met an educational goal they had set for themselves. In most of these cases the member had entered the service with the intention of obtaining technical training and an educational credential that he or she felt was necessary for a successful civilian career. When it was time to make the reenlistment decision they had not yet obtained the credential they thought necessary and so reenlisted either to pursue it or because they were not prepared for the civilian world.

The most puzzling question remained: Why did participation in education have such large effect on reenlistment in the Boesel and Johnson (1988) study and virtually no effect in this one? One of the first possibilities that came to mind was a difference in the populations. The Boesel and Johnson study did not provide extensive demographic data, but several measures were detailed. For example, the distribution of education participants by service, sex, ethnicity and pay grade were provided as was a profile of the Tuition Assistance user based on several demographic characteristics. Similar information was obtained from the DMDC data and the results compared.

The Boesel and Johnson (1988) study clearly detailed TA participation rates for each service by pay grade. Using the long-term measure of participation (LONGPART), frequency tables for each service by pay grade were calculated. Those in pay grades E-1 and E-2 were excluded. Service members in these grades are usually in a full-time training status and are very limited in their ability to participate in off-duty education. Additionally, service members only remain in these grades for a few months at most.

Viewing the results, table 6, one thing becomes readily apparent. Participation rates are extremely high in the DMDC data compared to the Boesel and Johnson study. In fact, the 1992 participation rates were several multiples of the 1985 rates. Depending upon pay grade, the Army's long-term participation rates in the 1992 data were 1.7 to 14 times greater than the 1985 rates. The Navy showed similar increases in participation rates while the Air Force had more modest rate increases but definite increases.

Table 6

Long-term Participation Rates by Service and Paygrade

	ARMY		USAF		NAVY	
	85	92	85	92	85	92
E-3	5.7%	9.77%	22.6%	21.75%	4.4%	5.43%
E-4	8.6%	22.43%	23.4%	38.83%	6.2%	10.97%
E-5	14.4%	45.79%	29.4%	56.2%	8.4%	24.94%
E-6	15.4%	61.87%	27.5%	69.28%	7.0%	39.45%
E-7	12.2%	69.14%	25.3%	79.6%	3.8%	53.21%
E-8	7.3%	80.98%	25.2%	89.2%	4.5%	56.64%
E-9	6.4%	89.58%	15.5%	90.6%	4.7%	53.43%

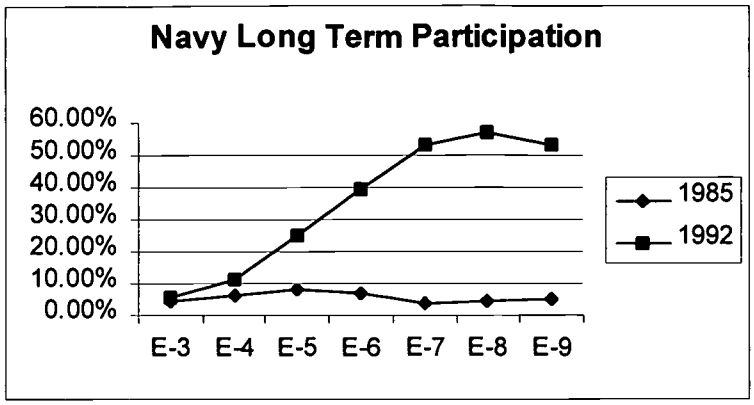
Probably more important than the differences in long-term education participation rates between the two data sets are the differences between the two in participation patterns. The Boesel and Johnson (1988) study showed the long-term participation rate rising with grade, peaking at E-5 or E-6 and declining steadily thereafter for senior non-commissioned officers. The DMDC data revealed an entirely different pattern. The participation rate increased steadily as grade increased and did not peak until E-8 or E-9. The pattern is present in all the services although the magnitude varies somewhat.

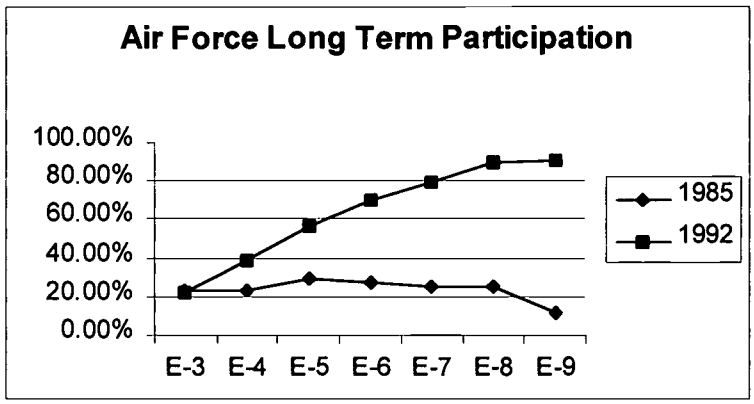
When the long-term participation rates are plotted by pay grade (figure 1) the differences become readily apparent. Boesel and Johnson noted the low long-term participation rates for senior enlisted members in their study:

> Because those who have been in the military longer have had more opportunities to participate in the TA program at some time or other, one would expect usage to increase with longevity, and therefore, to a considerable extent, with paygrade. In fact, if records were maintained throughout a member's service life and the use of TA had followed a stable pattern for the last 20 years, one would expect the participation rate to rise monotonically with longevity, unless TA users leave the service earlier than non-users. (Boesel & Johnson, 1988, p.8)

But Boesel and Johnson (1988) found just the opposite in their data. TA users were less likely to leave the service. Why then this anomaly in their data? Perhaps the answer lies in their previous observation, "had the use of TA followed a stable pattern for the last 20 years" (p.8). My data from the 1992 DMDC data set followed the long-term participation pattern that Boesel and Johnson intuitively expected and did not see. Perhaps the education participation pattern was not stable.

One possible clue to changes in participation patterns might be found in the short-term participation. Both the Boesel and Johnson (1988) data and the DMDC data set contained a measure of participation during the previous year. Again, the short-term participation rates were looked at to see if they were similar between the two data sets. Again the differences are astounding (figure 2). The results varied by pay grade and service, but short-term participation rates were up significantly in every category. On average, the 1992 participation rate was 280% of the 1985 rate for the Air Force, 344% for the Navy and 458% for the Army.





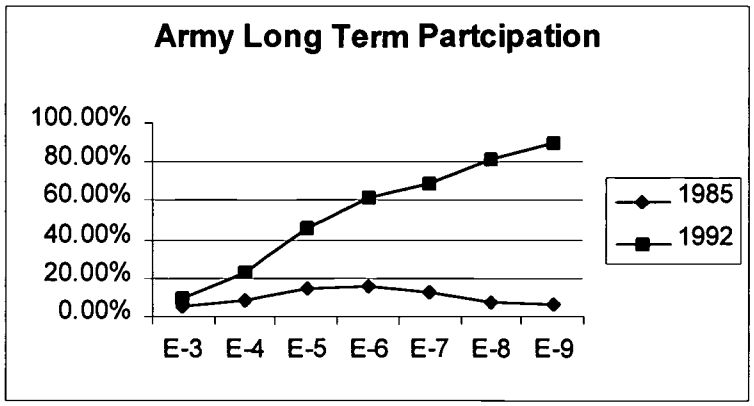
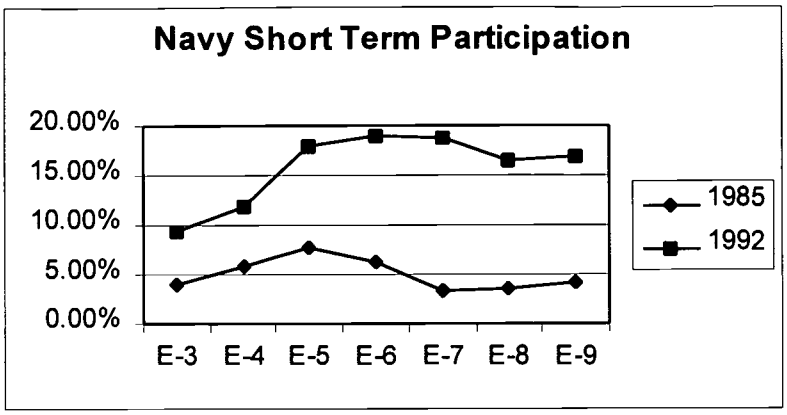
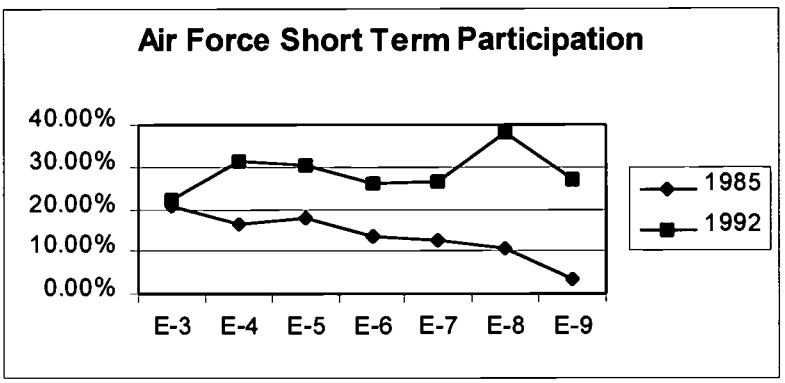


Figure 1. Long-term education participation rates by military paygrade. Boesel and Johnson data (1988) is labeled 1985 and rates from DMDC data set are labeled 1992.





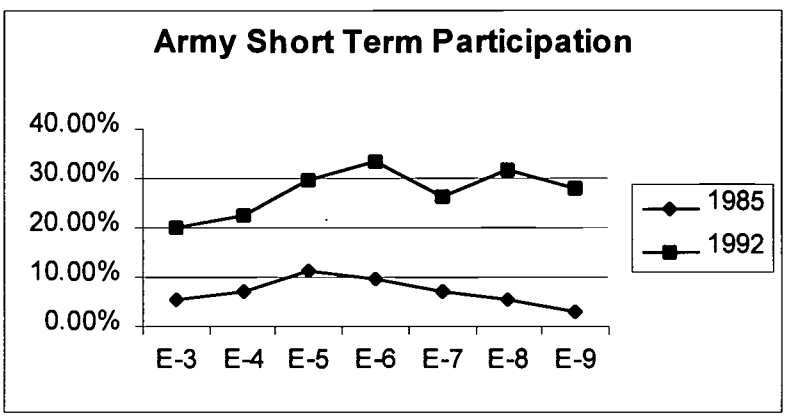


Figure 2. Short-term education participation rates by military pay grade. Boesel and Johnson (1988) data is labeled 1985 and rates from the DMDC data set are labeled 1992.

Certainly some of the increase in participation rates could be attributed to differences in measurements. The Boesel and Johnson (1988) data counted only participation from TA use while my measure counted all funding sources. As already discussed, many servicemembers use more than one funding source. Over the relatively short period of one year the proportion who used multiple funding sources would of course be smaller than over an entire military career. My measure of short-term participation (SHRTPART) probably does overstate the difference between participation rates from 1985 to 1992, but certainly not to the degree that the rates have changed.

Just as with the long-term participation patterns, the short-term participation patterns exhibit a remarkable change for the upper enlisted pay grades. The 1985 data showed strong peaks in short-term participation at the lower pay grades with very low participation rates for Senior Noncommissioned Officers (NCO). The 1992 data reveals high participation rates for all of the NCO grades including the senior grades. When the participation rates are plotted together (figure 2) it is clear that the participation rates are much more nearly level in the latter data regardless of grade.

If participation patterns had changed markedly based on pay grade, perhaps other participation patterns had changed as well. The demographic breakdown in participation rates is limited in the Boesel and Johnson (1988) study, but a few group identifications are available. Participation rates by race, sex, education level and Armed Forces Qualifying Test (AFQT) score are available. All of these factors except AFQT score are available in the DMDC data set.

This study focused only on enlisted participation in off-duty education, but the participation rates cited by Boesel and Johnson for the various sub-groups include both officers and enlisted personnel. To make comparison with Boesel and Johnson meaningful, frequencies

were calculated for the desired sub-groups using the entire DMDC data set, both officer and enlisted. These relative participation rates of groups defined by race and sex should not be confused with the changes in participation rates for blacks and women previously discussed. The previous discussion concerned differences in the participation profiles that controlled for numerous other factors such as pay grade, enlistment period, service affiliation, etc., while the 'raw' participation rates now being discussed do not.

We first looked at the participation rates separated by race. Although the DMDC data set provided several ethnic and racial categories, Boesel and Johnson (1988) only provided participation data for blacks and whites. Comparisons were made between the 1985 and 1992 participation rates of these two groups. Just as with the differences in participation rates by pay grade, the participation rates in the 1992 DMDC data set were two to five times higher than the 1985 rates. Yet again, however, it was the change in the pattern within the data sets that seemed most significant.

As shown in table 7, for all the services in the 1985 data, black participation rates were higher than white participation. Boesel and Johnson hypothesized that this was the result of blacks joining the service in greater numbers than whites because they viewed it as an avenue of upward mobility with less institutional racism than the private sector. If upward mobility were a significant reason for enlistment, they reasoned, it followed that blacks would take greater advantage of all the opportunities for upward mobility including education. What is interesting in the 1992 data, however, is this reversal of relative participation rates (see figure 3). In all four services the participation rate of whites is higher than the participation rate of blacks.

Table 7

Comparison of Long-term Participation Rate by Race

	Army		Navy		USAF		Marines *
Race	1985	1992	1985	1992	1985	1992	1992
Black	10.90%	42.11%	5.70%	19.71%	25.80%	51.63%	23.80%
White	8.80%	42.96%	5.10%	30.04%	23.90%	54.49%	26.50%

* Note: Marine data not available in Boesel and Johnson study.

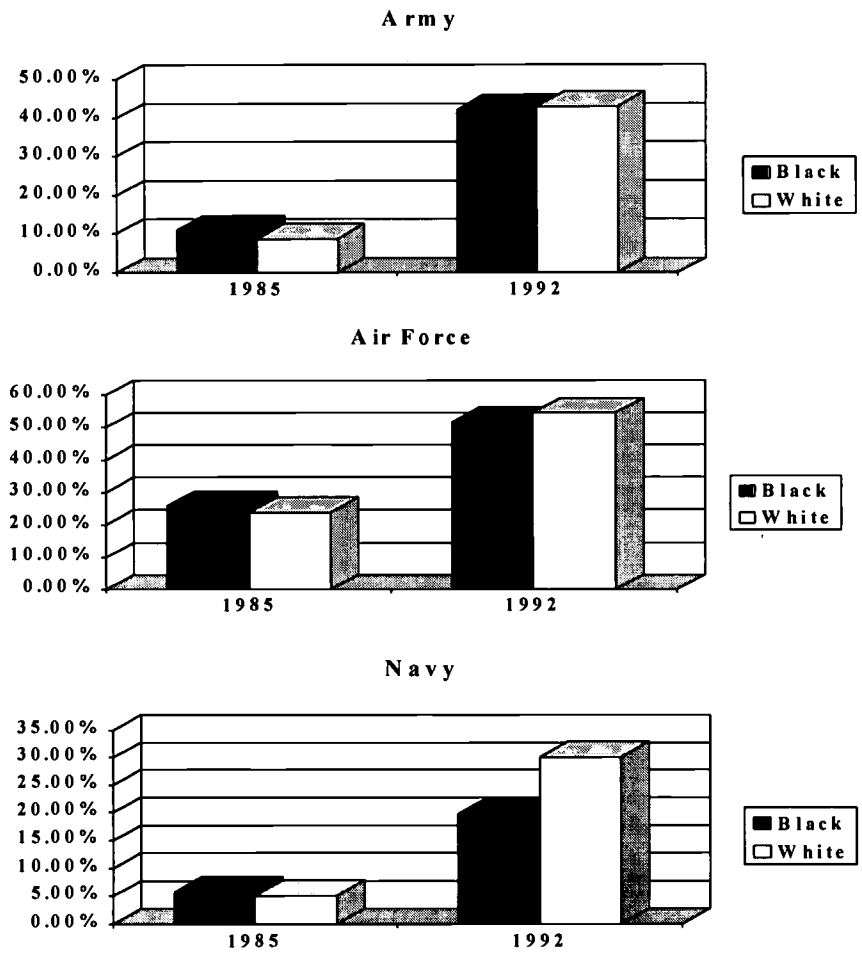


Figure 3. Long-term participation rates by race and year.

A similar comparison was made of the participation rates of males and females. As indicated in figure 4, in the Boesel and Johnson (1988) data, the participation rate of females is

higher than the participation rate for males. Boesel and Johnson hypothesize that females participate in greater numbers than men do for the same upward mobility reasons that racial minorities did. Again, the patterns of participation are significantly different between the 1985 and 1992 data. In the Air Force and Army the proportions are reversed. That is, males are

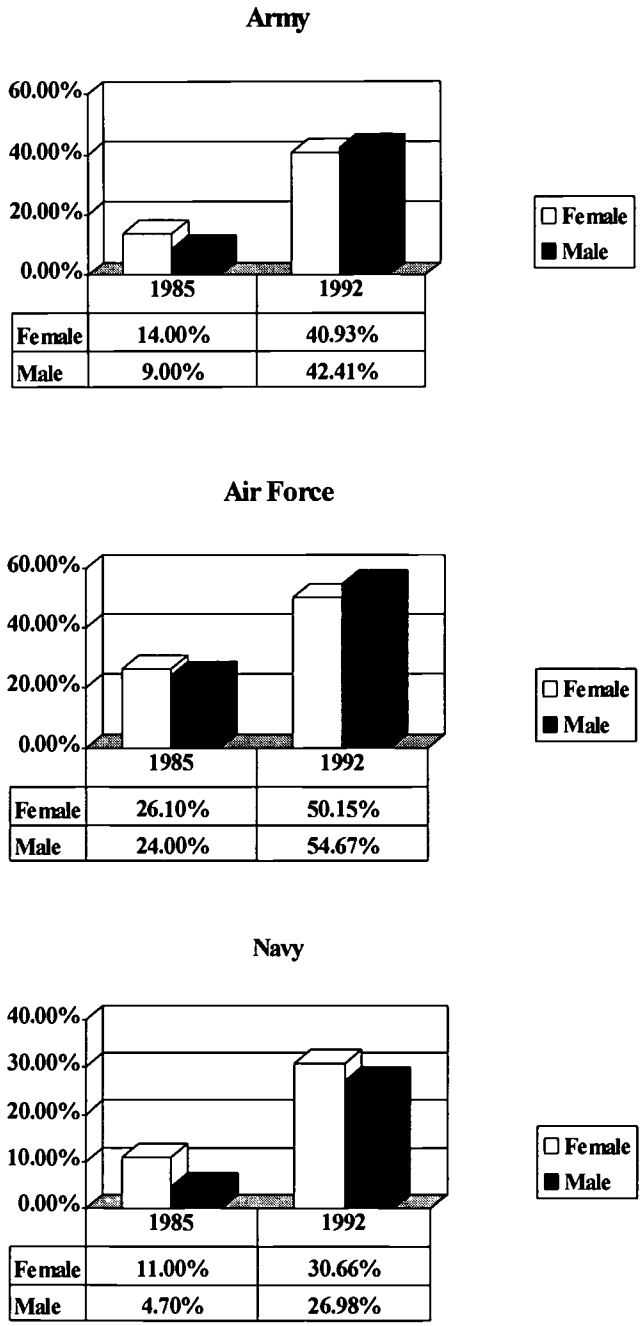


Figure 4. Long- term participation rates by race and year.

participating in greater numbers than females. In the Navy the rates do not reverse but are much closer to even than in the 1985 data. Where before females participated at rates twice that of males, in the 1992 data the female participation rate was only 14% higher than males. Although we cannot compare Marine participation rates with the 1992 Marine data show a pattern similar to the Navy with the female participation rate approximately 23% higher than that of the males. It may be that the higher sea duty rates of males in both of these services still effect education participation rates. A study by Green and Dunlap (1988) of Navy participants in off-duty education found much higher participation rates for women that was related to their higher numbers in shore based specialties.

The last comparison between Boesel and Johnson (1988) and the DMDC data was between education participation rates by education level. By only using those education levels that were the same in both data sets a meaningful comparison across different levels was obtained. Only short-term participation rates were compared as this variable was measured very similarly in both data sets and thus provides a comparison of any changes that occurred between the studies. Because of differences in the education levels available in the data sets, only two education levels were compared, 2 years of college and college graduate. A comparison of those below the 2-year mark would have been useful, but the data collection methods did not allow it. The results are contained in table 8.

Even allowing for the differences in the measurement of short-term participation between the Boesel and Johnson (1988) study and this one, the participation rates are considerably higher in the latter data with one exception. The participation rate for those with a BA/BS degree in the Air Force did not increase substantially. I attribute this to the long standing pressures predating the 1985 data collection for Air Force Officers to complete a master's degree to remain

competitive for promotion. Those pressures have kept the participation rate of officers, all of whom have a bachelor's degree, high.

When the frequency tables comparing participation to education level were examined, several other interesting relationships became apparent. If we look at long-term participation, that is participation defined by a change in education level, we find that the group with the highest participation rate is those who enter with no college. As this is the group who most easily changes their education level, even by taking only one course, this could be expected. If we look at short-term participation rates by entrance education level we find that those that entered the service with some college are the most likely to have attended a civilian college within the previous twelve month period, followed by those with a two year degree and then those with no college. If we compare the short-term participation rates by present education level, we find those with a two-year degree or some graduate work the most likely to be participating. It makes sense that those working on a bachelor or master's degree would most likely participate in off-duty education. The steep drop in participation rates for those with a Bachelor's or Master's degree further supports this premise. It is interesting that the short-term participation rates for those who presently have any degree are higher than those who entered the service at the same level. For example, among those who entered the service with an associate's degree 22.08% participated in off-duty education in the year proceeding the 1992 DMDC survey while among those who earned their associate's degree while on active duty 44.03% participated in the same period. For those at the bachelor's level the numbers follow a similar pattern at 19.11% and 53.94 % respectively. This indicates that those who attain a higher educational level in the service are more likely to continue their education than those who enter with the same attainment level are. It may be that those with college experience prior to the

service enter because the educational experience was not satisfactory, while those without college experience are more likely to enter with the intention of attending school. Another explanation is that those who start their education while in the service are more likely to enjoy or value the experience and desire to obtain more education.

Table 8

Comparison of Long-term Participation by Education Level

	Army		Navy		USAF		Marines *
Level	1985	1992	1985	1992	1985	1992	1992
2-year	9.6%	44.33%	7.8%	35.85%	21.6%	51.37%	44.02%
College Graduate	4.8%	14.37%	1.9%	17.3%	15.7%	17.78%	10.98%

Note: Marine data not available in Boesel and Johnson (1988) study.

DISCUSSION

Despite the lack of an espoused theoretical foundation, the Boesel and Johnson (1988) study was taken as a benchmark for this research because from a statistical point of view it was the most relevant found in the existing literature. It used a large sample with sound sampling methodologies, was fairly recent and carefully controlled for a least some of the other factors thought to be connected to reenlistment in the services. For the most part the DMDC data suggest that the military student behaves much as the literature suggests in terms of sub-group education participation behaviors. But just as clearly the data strongly indicate that the education participation effect so strong in the Boesel and Johnson study had all but disappeared. If this drastic change were to make sense, the underlying theoretical mechanism for the change would have to be found.

A careful review of both the Boesel and Johnson data and the DMDC analysis results began to yield some clues. One of the most dramatic differences between the Boesel and Johnson data and the DMDC data was in the participation patterns based on pay grade. Recall that long-term participation rates for the top enlisted grades were quite low compared to the mid-tier enlisted group in the Boesel and Johnson data (figure 1). If participation patterns remained relatively stable over a long period of time this result is counter intuitive unless participants left the service sooner than non-participants did. Boesel and Johnson found just the opposite effect from participation, however. That is, participants were apt to stay in the service longer than non-participants were. They offered no explanation for this conundrum, yet the obvious answer is that education participation patterns had not remained stable over the two-decade plus period represented by Boesel and Johnson's survey respondents. On the other hand, the analysis of the 1992 DMDC data supported their expected result, that is, long-term participation rose steadily with pay grade suggesting that participation in off-duty education was fairly stable over the time period represented by the military careers of the respondents in the 1992 DMDC survey. Obviously, something had changed between 1985 when the data for the Boesel and Johnson study were gathered and 1992 when the DMDC survey was taken. Because of the limited information available in the Boesel and Johnson report it is difficult to fix a specific time period when the education participation patterns changed. What is evident, however, is that the change occurred at the E-5/E-6 level in all the services. These grades can cover a huge period of time in a military career. In some services individuals could be promoted to E-5 with as little as three years of total military service. At the other end of the spectrum many service members are not promoted beyond the E-6 level and retire in that pay grade at the twenty-year point. The 1985 long-term participation seemed to peak with E-5 in the Air Force and Navy and at E-6 for the

Army. Grades that typically would be reached sometime between the fourth and tenth year of service. While this still presents a rather broad window, it allows a starting point for further analysis. In the 1985 data set participation rates appeared to be stable for only those service members who had entered the service during the six to ten year period before 1985. Service members who had entered the service at earlier dates did not appear to participate at the same rates.

The 1992 DMDC data presented an entirely different picture. It appeared that the probability of an enlisted member participating in off-duty education was very high as they advanced in grade. In fact, for the Army and Air Force the probability was approximately ninety percent for those reaching the top of the enlisted grades, E-9. As educational attainment plays at least some role in military promotions, some of the connection is expected. If an education improves your chances for promotion, those promoted to the highest grades are more likely to have the most education. However, a careful reading of the data suggests the relationship is not that simplistic. If we look at the long-term education participation rates by enlistment period, table 9, we see a similar pattern.

While the total percentages are not quite as high as they are for the very top enlisted grades, clearly the overwhelming majority of enlisted personnel who make a career of the service, five enlistments or more (approximately 20 years), participate in off-duty education at some point in their careers. This is particularly apparent in both the Army and Air Force where at least three-fourths of the career personnel have participated. In other words, it appears that participation in off-duty education is strongly connected with a military career, particularly for the Army and Air Force. Further, the pattern of participation is relatively stable throughout that career.

What if participation in off-duty education had become the norm or even an expectation if you will, for military members? If you intend to remain in the military service and make a career of it, you must participate in off-duty education. Not only would this explain the huge change in participation patterns, but it also might explain why the participation effect had become so small. If a military career required participation in off-duty education for advancement and thus longevity because of the military's 'up or out' personnel policies, perhaps the effect of long-term participation might be contained within the pay grade and enlistment period variables. Further, if education participation was required for a successful military career and thus became part of the military way of life, those who refused to participate or found themselves unable to over a long period of time might become dissatisfied with the military way of life while those who were content with the need for educational attainment would be more satisfied with the military way of life. It could be that this need for education had become so entwined in the military culture that differences in the reenlistment intentions of participants and non-participants were fully explained by other variables such as pay grade, enlistment period and satisfaction with the military way of life.

Table 9

Long-term Education Participation Rates by Enlistment Period

Enlistment Period	Army	Navy	Marines	Air Force
1	13.57%	9.34%	10.85%	27.88%
2	34.89%	25.06%	26.00%	44.74%
3	58.30%	39.02%	37.83%	62.40%
4	66.53%	48.12%	46.36%	70.43%
5 or more	74.99%	50.21%	53.46%	78.01%

While the qualitative data gathered from the interviews by no means can be considered a valid sample for the entire military population, the shear weight of the evidence in that small sample does provide a confirmatory data point. Consider that the respondents related their experiences and impressions from their entire military careers, which collectively represented scores of locations and over 328 years of service. Nearly all provided strong evidence that the military values education, encourages it and rewards it. But beyond that, some of the evidence from the interviews supports the premise that military people believe education is required for a military career. If you want to stay in the service you must get promoted. To get promoted you must get educated. Does everyone do it? Of course not, but not everyone gets promoted either. Recall that nearly 90% of those in the top enlisted grades in the Army and Air Force have participated as have 75% of all career members regardless of grade.

Taking this reasoning one step further, if a military career required participation in off-duty education, those who wished to have a career would desire to participate, if for no other reason than to support their goal of a military career. The analysis of the DMDC data supports this premise, finding the desire to participate in education (EDWANT) significantly ($p = .0001$) and positively related to intention to reenlist. The qualitative data again supports this reading.

Other pieces of the puzzle also seemed to fit. Recall that the Boesel and Johnson (1988) study, table 10 showed a sharp decrease in short-term education participation rates for pay grades above E-5 for all three services in the study. The DMDC 1992 data showed much more constant short-term participation rates for all grades, particularly amongst NCOs. This level pattern is very evident in the Army and USAF data. The Navy data do exhibit a slight drop in the senior petty officer ranks, but nowhere near the magnitude of the participation peak seen in the 1985 data. Only in the Marine Corps is there a distinct peak in educational participation rates

that occurs at the E-5, E-6 ranks. The 1992 population seems to be participating fairly equally at all career stages, behavior that would make sense if participation in off-duty education were an accepted, even expected, practice as part of a military career.

Table 10.

Comparison of Short-term Education Participation Rates

	Army		Navy		USAF		Marines *
Grade	1985	1992	1985	1992	1985	1992	1992
E-3	5.6%	19.96%	4.00%	9.36%	20.90%	21.97%	9.80%
E-4	7.1%	22.39%	5.80%	11.92%	16.20%	31.10%	14.13%
E-5	11.1%	29.49%	7.70%	17.87%	17.80%	30.14%	20.27%
E-6	9.6%	33.14%	6.30%	19.01%	13.30%	25.95%	19.49%
E-7	7.2%	26.17%	3.30%	18.66%	12.30%	26.27%	15.91%
E-8	5.3%	31.81%	3.60%	16.52%	10.70%	36.90%	13.96%
E-9	2.9%	27.75%	4.10%	16.92%	3.60%	26.77%	9.81%

Differences between the services may well reflect differences in opportunities and service member attitudes about educational attainment. Likewise, members of the various services or perhaps the services themselves seem to exhibit different attitudes toward education. If the services had undergone a significant change in their philosophy of the worth of off-duty education, there should be other evidence in the data under analysis.

One of the other noticeable differences in the education participation patterns between the Boesel and Johnson (1988) study and the analysis of the DMDC data set was in the relative participation patterns based on race and sex. Recall that in the Boesel and Johnson (1988) data blacks and females participated at higher rates than whites or males in all three services examined. They attributed the higher participation rate for these groups to a greater propensity

for their members to join the service for upward mobility opportunities because the services had fewer institutional barriers than the private sector.

If that premise is so, it follows that whites and males join in higher numbers for reasons other than upward mobility. If the services had changed their view toward off-duty education and indeed it had become an integral part of a military career it is quite plausible that all service members who wished to remain in the service for a career, regardless of the reason why, would be likely to participate in off-duty education. If this were the case, we might expect education participation patterns based on demographics to change.

Indeed the 1992 DMDC data was strikingly different from the Boesel and Johnson (1988) data. With one exception, relative participation rates based on demographics have reversed. For all services whites are more likely to participate than blacks and except for the Navy, males are more likely to participate than females (see figures 3&4). Even in the Navy the difference in participation rates has closed markedly from the 1985 data. The differences in sea duty rates between males and females in the Navy may still account for the slightly increased participation rates of female members.

If we look a bit further we find evidence to support this change in education participation patterns by sex within Boesel and Johnson (1988). Their study contained an abbreviated analysis of a second data set. This data was from the National Longitudinal Survey of Youth Labor Market Experience (NLS). They analyzed the educational participation of survey participants who had entered the armed services during the longitudinal study. The rather small sample consisted of 1200 people who had been in the military between 1979 and 1982. Education participation was based on a question that asked whether they had taken any courses for credit

during their military service. The results were very interesting in that they varied from Boesel and Johnson's larger sample in two ways:

> First, the NLS data indicate that men are more likely than women to participate in voluntary education, while the TA data indicate that women are the more likely to participate, specifically in the Tuition Assistance program. Second, in the NLS analysis there is no perceptible relationship between the reenlistment intentions of participants and non-participants in voluntary education, while the analysis of TA data shows a marked difference in intentions between Tuition Assistance participants and non-participants. (1988, p.A-7)

The 1992 DMDC data and the NLS data both point to similar participation patterns and the neutral reenlistment effect. When we again ask why, the Boesel and Johnson (1988) report might provide the answer. Trying to explain the difference between the two data sets they analyzed they stated:

> The NLS data set comprises observations primarily on junior enlisted members between 1979 and 1982, a time when the enlisted force was substantially different from the force in 1985, both in terms of quality and motivation (Boesel & Johnson, 1988 p.A-7).

Boesel and Johnson were probably alluding to the recruiting difficulties the service experienced during the mid to late seventies that resulted in many recruits entering service who had lower educational attainment and Armed Forces Qualifying Test (AFQT) scores. Alternatively, however, I might propose that the population is indeed different, but different in that their off-duty educational participation patterns have changed significantly from those recruits who had entered the service even a few years earlier. Recall the Boesel and Johnson (1988) TA data suggest that educational participation patterns are stable over time only for those who entered the service sometime after the 1975 to 1979 time frame. The NLS sample is firmly in this period. Perhaps what they were seeing was the change in how education is related to the military career, a change that is fully evolved by the 1992 DMDC survey.

The differences in participation rates by race and sex that we have just discussed are based on raw numbers that have not been adjusted for other differences in the sub-populations such as pay grade, education level, age, etc. We know from our own profiles of education participants that these factors do change the relative participation rates between groups. While the differences noted provide far from conclusive confirmation of the emerging theory, neither do they reject it.

At this point, we are faced with strong evidence that something has changed in the relationship between participation in off-duty education and reenlistment during the seven years that separates the two data sets. One plausible explanation is that there has been a fundamental change in how the services view off-duty education, with the theory being that participation in off-duty education has become an accepted and expected part of a military career. That is, the military organization values educational participation and not only encourages enlisted members to pursue it, but demands that they do so. Again, the qualitative data supports this theory with several of the respondents using terms that suggest the organizational pressures to participate are substantial.

This also provides a possible explanation for the lack of a difference in the education participation effect on reenlistment based on the educational level of the service member. All service members are equally motivated to participate in off-duty education, early on because the service demands it and later because they value education for education's sake. We might go so far as to say that participation in higher education has become part of the organizational culture.

If the organizational culture did change in regard to the value of education, when and why did this occur? I offer the following explanation for both of these questions.

In 1972, in large part because of the anti-war sentiment resulting from the Vietnam War, Congress, by eliminating the draft, created the All Volunteer Force (AVF). The military almost immediately had recruiting problems. When the draft was ended the military pay and benefit structure was overhauled to attract young people into the service. Although initially successful, by the late 70s the military found recruiting goals harder and harder to fill, particularly for the Army. Fewer numbers of "high quality" (those in the 50th percentile or higher on the Armed Forces qualifying exam) recruits were enlisting.

The crisis that the military faced was a shortage of qualified recruits. Their response was to offer educational benefits to attract the 'right' people. The 'right' people desired education. The services placed a high value on education to solve the crisis they were experiencing. Many policy makers perceived that part of the problem was the desire by many of these 'high quality' youths to pursue a college education. The availability of student loans and other federal student aid programs was seen as competition for the services (Congress of the U.S. 1982).

The decade beginning in the mid-seventies can surely be called the decade of the GI Bill. Beginning with the ill-fated and short lived Veteran's Educational Assistance Program (VEAP), through a myriad of test programs and culminating with the New or Montgomery GI Bill in 1985, Congress studied and debated military educational benefits extensively (Angrist, 1993). The common thread throughout this entire period is the discussion of educational benefits primarily as a recruitment tool. The driving goal of both the services and the Congress is to recruit educated and bright soldiers. (Congress of the U.S. 1980; Congress of the U.S. 1982; Congress of the U.S. 1983; Congress of the U.S. 1985; Congress of the U.S. 1986).

The evidence was overwhelming that the goal of these programs in the eyes of both the services and the Congress was to attract 'high quality' youths into the services. The strong

consensus in the literature is that these programs met that goal. Educational benefits became a prime marketing tool to entice the 'right' people into the services. High school graduates of high mental ability are more likely to successfully complete training and their full enlistment term (Congress of the U.S. 1986). These are the same recruits who value the educational benefits the most. This desire is sometimes a double-edged sword, cutting both ways. Although the evidence is mixed, there is some concern that military members who value higher education and have post-service educational benefits, available use them. That is, they depart the service upon the end of their initial enlistment to finish their education (Polich et al., 1982; Fernandez, 1980; Smith et al., 1990; Congress of the U.S. 1982). To counter this possibility, the services have aggressively marketed their in-service educational opportunities, the voluntary education programs. Having a job and still meeting your educational goals was a sentiment expressed several times by those in the interviewed sample.

In addition to this change in those whom they recruited, the military was undergoing other transitions as well. The eighties were a time of significant growth in military spending. Much of that spending was for high tech weapons which the military termed force multipliers. The concept was that the US Forces needed superior technology to overcome the superior numbers of Soviet forces. This was true for all the services and high technology weaponry was procured for infantrymen as well as carrier pilots. With the technology came the need for skilled operators and technicians and hence the need for education.

The military's response to this need was to recruit 'college capable' youth into the service. They did this by aggressively marketing the educational opportunities of a military career. Remember the Army College Fund and the "Be All You Can Be" advertising campaigns?

I believe this was the start of a new high tech military environment populated by servicemembers who were capable of higher education and also had the desire. The result was a new cultural value spawned by new people in the organization and a new organizational environment.

Recall that the data suggest that education participation patterns began to change somewhere between 1975 and 1979. If that change indeed began then we could expect to see it fully implemented within ten to fifteen years. Those military members who had grown up under the old system and risen to the top based on the old values would be retired by that point. Those mid-career people who did not embrace the new values would not be advanced and would likely face early retirements because of the services 'up or out' promotion policies. Thus we could expect to see the entire organization adopting the new educational value by 1992, the date of the DMDC data collection. Indeed, from the analysis of the 1992 DMDC data it appears that the off-duty education participation patterns remained stable for most of a career.

While far from conclusive, both the quantitative and qualitative data provide evidence of this emerging theory. The education participation effect has not disappeared, but rather has been absorbed into the military culture where it hides behind other variables, such as pay grade and satisfaction with the military way of life. Being military means going to school and believing in the goodness of education. The hiding of the effect is not a simple correlation of the variables, although at least for pay grade the correlation with long-term participation is moderately high at 40%. What I am proposing is a cultural value so strong that to not accept its validity is to not accept the culture and hence to not reenlist. A value exhibited by the unusually high educational aspirations of the military student and the love and belief in lifelong learning so many of them seemed to have developed through an evolutionary process that started from an external 'shove'

by the military system. I can offer no other explanation for the drastic changes in participation patterns based on pay grade or the higher short-term participation rates for those who have earned their degrees in service versus those who entered with them.

CONCLUSIONS

The quantitative analysis alone supports the conclusion that long-term participation in off-duty education is significantly and positively related to intention to reenlist when several other variables thought to be related to retention are controlled for. Additionally, the data support the statement that the desire for off-duty education, whether the service member participates or not, increases the probability of reenlistment. The reenlistment intention of servicemembers who participate in off-duty education is less sensitive to job dissatisfaction and those who participate exhibit greater satisfaction with the military way of life. The spouses of service members who participate in off-duty education are more likely to support the reenlistment decision as are those spouses satisfied with their own educational opportunities.

Having said all of that, from a practical point of view, the overall education participation effect is very small, accounting for very little of the variation in intention to reenlist. This is a reversal from the previous most similar study (Boesel & Johnson, 1988). Further analysis of the variables used in the models reveals overall satisfaction with the military way of life, pay grade and the spouse's support for the reenlistment decision account for nearly all of the variation in reenlistment intention present in the model. Analysis of the participation patterns of both the previous data (Boesel & Johnson, 1988) and the 1992 DMDC data set leads to the conclusion that there has been a fundamental change in the relationship between off-duty education and retention in the intervening seven years.

Both the quantitative and qualitative data point to the conclusion that the military has adopted educational participation as a cultural element. That is, participating in off-duty education is part of being in the military just as is wearing a uniform. Because this element is so entwined within the environment, satisfaction with the military way of life and advancement or paygrade account for most of the variation in reenlistment intention. Actual participation is not required, rather the acceptance of the value or 'rightness' of education is enough. I hypothesize that this cultural change has been driven by three different influences, the end of the draft being the first. Difficulties recruiting qualified servicemembers necessitated targeting college capable young people. The military did this through the enticement of both in-service and post-service educational benefits. The success of this approach resulted in the second influence in this cultural change, the service members themselves. A service populated with college capable and attending members created forces for cultural change. The last element was changes in force structure and the technology of war that required higher educational levels for mission accomplishment. The combination of these three elements resulted in a fully absorbed culture of education by the late eighties or early nineties. Participation in off-duty education is indeed related to retention in the service, but in a highly complex manner that cannot be fully analyzed through quantitative methods alone.

RECOMMENDATIONS

I offer the following recommendations that carry implications for both policy makers and researchers. One of the first things that come to mind is the complexity of the construct 'participating in off-duty education'. Previous studies have used measures of long-term participation and short-term participation interchangeably. As this study has revealed, the two

measures do not get at the same construct. This difference may explain why previous studies that looked at participation and retention have produced conflicting results. They may have been looking at different things. Policy makers should insure that the measure they are looking at indeed captures the construct they think it does. Further research is warranted in establishing a better understanding of the differences and similarities of these two concepts.

That leads to my second recommendation. Both policy makers and researchers are cautioned not to take too simplistic a view of the retention phenomena. The best model I tested only accounted for 40% of the variation in intention to reenlist. Most of that accounted for by a measure of "overall satisfaction with the military way of life," a concept hard to define and quantify. Further research is needed to develop better models to predict reenlistment.

Closely related to the last recommendation is another caution. The Armed Forces have successfully inculcated an entire organization with a strong appreciation and desire for education and thus educational opportunities. This cultural element is a complex one that merits further study. Both qualitative and quantitative approaches are needed to better understand how and when the cultural change took place and how it effects the attitudes and behaviors of both the members of the organization and the organization itself. It is highly likely that not all services and not all parts of each service have the same cultural values. Rather, it is highly likely that sub-cultures exist between and within each service. Large changes in educational policies, reduction in benefits or other wholesale changes to the military voluntary education programs are apt to have significant effects that were not foreseen. Policy makers should use extreme caution lest they find themselves fighting the culture they have so successfully created.

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