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PROFILING MARKET POTENTIAL FOR NAVY RECRUITING AT THE LOCAL GEOGRAPHICAL LEVEL

by

Christine Elizabeth Huzar

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Thesis Advisor: Stephen L. Mehay

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The main conclusions of the study are:

a. intention propensity can be forecasted at the Navy recruiting district level;

b. a propensity index could be used to allocate the number of recruiters and recruiter goals at the Navy recruiting area and district level;

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Profiling Market Potential for Navy Recruiting
at the Local Geographical Level

by

Christine E. Huzar
Lieutenant, United States Navy
B.A., State University of New York College at Buffalo, 1974

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Author: Christine E. Huzar
Christine E. Huzar

Approved by: Stephen L. Mehay
Stephen L. Mehay, Thesis Advisor

Jules I. Borack, Second Reader

David R. Whipple, Chairman
Department of Administrative Sciences

James M. Fremgen,
Acting Dean of Information and Policy Sciences

ABSTRACT

This thesis investigates several alternative methods for estimating intentions to join the United States Navy. The Youth Attitude Tracking Study (YATS) is used to obtain the intentions of young male respondents to join the military, and specifically the Navy. Intention propensity indexes are calculated for Navy recruiting areas and districts.

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I. INTRODUCTION AND LITERATURE REVIEW

A. PROBLEM AND BACKGROUND

When President Nixon abolished the draft in 1973, he opened a Pandora's Box of questions for the military. One critical question the military had to address was how to attract qualified youths into the all-volunteer military (AVF). Advertising techniques and recruiting methods all assumed greater inportance in the AVF environment. Recruiting issues included recruiter goal allocation and determining market share of the "high quality" male youth population.

Most recruiting efforts today are concentrated on highly qualified non-prior service male youths. These are 17-21 year old males who have graduated from high school and are classified as I-IIIA by the Armed Forces Qualification Test (AFQT). Those individuals who do not possess at least a high-school diploma are approximately twice as likely not to complete their initial enlistment contract whereas those that score at or above the median Armed Forces Qualification Test score are more likely to complete technical training. [Ref. 1:p. 225] This group of individuals is considered "supply constrained" and substantial effort is required to recruit the quantity necessary to maintain combat readiness. Females, non-high school graduates, and

individuals classified as IIIB and below by the Armed Forces Qualification Test, are considered to be "demand constrained." The requirements for these groups are such that the supply is in excess of the services' goals.

In recent years, only the Army has occasionally failed to meet its goals for highly qualified non-prior service male youths; and this failure was a small miss occurring several years ago. All the other services have been able to recruit the quantity of highly qualified non-prior service male youths that are desired to meet mission readiness.

There has been some concern in recent years that the services will have problems reaching their recruiting goals for highly qualified non-prior male youths. The United States Bureau of the Census has projected that there will be a steady decrease in the male youth population through the mid-1990s [Ref. 2]. This means the military will be competing with the private sector for its share of a decreasing supply of 17-21 year old males.

The decline of the 17-21 year old male population has not been the only factor potentially affecting military manpower supply. Acquired Immune Deficiency Syndrome (AIDS) appears to be a growing problem. Current military policy excludes potential recruits who test positive for the Acquired Immune Deficiency Syndrome virus during their initial enlistment physical. Many military leaders are concerned that Acquired Immune Deficiency Syndrome will also

greatly reduce the number of qualified male youth in the 1990s and possibly into the next century. In the face of these concerns, one response would be to abolish the all-volunteer force and reinstate the draft. However, reinstitution of the draft itself presents numerous problems. It is far more productive to have a military force that is willing to serve, than a military force of conscripted men who may have attitude problems [Ref. 3:p. 64]. Attitudes in the work place contribute a great deal to productivity. Low morale and dissatisfaction could reduce the combat readiness of the force [Ref. 3:p. 23]. Of course the draft may be necessary at some time in the future, especially if significant hostilities occur.

Another solution to the declining male youth population is to place more women in jobs currently filled by men. This solution, however workable, does not appear to be popular with the public--at lease in terms of placing women in combat positions [Ref. 4]. If the services cannot meet their recruiting goals for highly qualified male youths, public opinion may change when faced with the options--drafting men or placing women in combat positions.

If the services are not meeting their recruiting goals, this does not necessarily mean that these goals are unattainable. It is perhaps the way recruiting goals are distributed to the various recruiting commands that is at fault and not a shortage of supply. Under current goal

allocation models, it is quite possible that one command's goals are set too high while another command's goals are too low, relative to the potential supply in the area. If the goals are set too high for the area in which the command is located the recruiters will be unable to reach those goals, which will indicate a shortage of supply. If the goals are set too low for the area, the recruiters will not have the incentive to recruit much above the established quota. As a result, there may be an untapped supply of possible enlistees. In order to avoid a false perception of available supply, it is critical for the services to develop the best model possible to allocate recruiting goals down to their smallest components. A current solution to the declining male youth population, and one that could be implemented almost immediately, is to enhance the efficiency of fixed recruiting resources by improving recruiter goal allocation and recruitment methods.

B. U.S. NAVY GOAL ALLOCATION MODEL

The U.S. Navy currently uses different enlisted goal allocation models for various subpopulations based upon ethnic group, gender and other factors. A different model is used for prior service members, for non-prior service females, and for non-prior service males. The non-prior service male group is further sub-divided into four different models: high school diploma graduate/Armed Forces Qualification Test score 50-99; high school diploma

graduate/Armed Forces Qualification Test score 30-49; black upper mental groups; and Hispanic upper mental groups. A score of 50-99 on the Armed Forces Qualification Test would be equivalent to I-IIIA, also known as "A-cell group" or "upper mental groups." An Armed Forces Qualification Test score of 30-49 would equate to IIIB, also known as "Cu-cell group."

For purposes of this analysis, I will be concerned only with the non-prior service males in the upper mental groups. The regression model currently used by the Navy Recruiting Command [Ref. 5:p. 5] to forecast the number of new contracts for non-prior service males in the A-cell group is as follows:

$$\log C = A + r \log R + u \log U + p \log P + n \log N$$

where:

r = recruiter elasticity,

u = unemployment elasticity,

p = respective 'A' cell population elasticity,

n = respective non 'A' cell population elasticity,

C = forecast of new contracts,

A = constant,

R = number of projected on-board recruiters,

U = projected unemployment,

P = projected 17-21 year old A-cell population,

N = projected 17-21 year old male non A-cell population.

This regression model is used to forecast new contracts on the national level which then is also used to distribute quotas to the Navy recruiting areas/districts (except blacks and Hispanics in upper mental groups). The Navy divides the nation into 6 areas which are further divided into 41 Navy recruiting districts. Appendix A lists the Navy recruiting areas and districts.

The regression model [Ref. 5:p. 12] used for forecasting black new contracts for non-prior service males in the A-cell group, is as follows:

$$\log CB = A + r \log R + u \log U + n \log BP + \log B$$

where:

r = recruiter elasticity,

u = unemployment elasticity,

n = 'A' cell black population elasticity,

CB = forecast of new contracts for blacks,

A = constant,

R = number of projected on-board recruiters,

U = projected unemployment,

BP = projected 17-21 year old male A-cell black population,

B = percent black.

The regression model [Ref. 5:p. 13] used for forecasting Hispanic new contracts for non-prior service males in the A-cell group, is as follows:

$$\log CH = A + r \log R + u \log U + s \log S + \log H$$

where:

r = recruiter elasticity,

u = unemployment elasticity,

s = 'A' cell hispanic population elasticity,

CH = forecast of new contracts for Hispanics,

A = constant,

R = number of projected on-board recruiters,

U = projected unemployment,

S = projected 17-21 year old male A-cell Hispanic population,

H = percent Hispanic.

According to the Navy Recruiting Command the above models are extremely accurate at the national level and accurate at the area level, but not very accurate at the district level. [Ref. 6]

One dependent variable that may be significant for predicting new enlistment contracts is the employment plans or military enlistment intentions of male youth within a specific local area, such as a Navy recruiting district. If this variable is significant it may help to increase the

accuracy for forecasting new enlistment contracts at the Navy recruiting area and district level. The purpose of this thesis is to investigate the use of military enlistment intention data at the local level.

C. U.S. MARINE CORPS GOAL ALLOCATION MODEL

The U.S. Marine Corps currently uses intentions to join the Marine Corps to calculate the percent of national quota to assign to a given recruiting area, the percent of the "interested" market in the area and the percent recruiter distribution for the region. The "special market" is the estimation of Qualified Military Available (QMA) taking into account mental category accession goals. The QMA is defined as the population of 17-21 year old male high school graduates available for service in the military. The equation used is:

$$\begin{pmatrix}\%\text{ of National Quota} \\ \text{or} \\ \%\text{ Recruiter Distribution} \\ \text{or} \\ \%\text{ of the Interested Market}\end{pmatrix} = \begin{pmatrix}\%\text{ of Special} \\ \text{Market}\end{pmatrix} \times \begin{pmatrix}\text{Propensity} \\ \text{Index}\end{pmatrix}$$

The propensity index is measured using four variables:

1. Propensity from the Youth Attitude Tracking Study (YATS).
2. Priority Prospect Card (PPC) return rate.
3. Unemployment rate.
4. Productivity rate.

The YATS survey is used to produce a YATS propensity index.

$$\text{YATS Index} = \frac{\text{District Positive USMC Propensity Rate}}{\text{National Positive Propensity Rate}}$$

The PPC is used to develop a PPC index. First, the percent quality leads are calculated by dividing the number of quality leads by the volume of mailings. The PPC index is then determined using the following:

$$\text{PPC Index} = \frac{\text{District \% Quality Leads}}{\text{National \% Quality Leads}}$$

The unemployment index is determined by dividing the district unemployment rate by the nationwide unemployment rate.

Recruiter productivity is determined by dividing the number of new contracts from prior years by the table of organization of recruiters. The district productivity divided by the national productivity produces the productivity index.

There are three QMA categories for 17-21 year old male high school graduates: I-IIIA, IIIB and IV. To determine a district's share of the special market for I-IIIAs, the district's QMA is multiplied by .63 percent. The result is the total I-IIIA QMA for the district. The following equation then is used to determine their percent of the special market.

$$\% \text{ I-IIIA Market} = \frac{\text{Total I-IIIA for District}}{\text{Total I-IIIA Nationally}}$$

The same process can be applied to the IIIB and IV mental category groups. The district's QMA is multiplied by .36 and .01 respectively to determine the district's share of IIIBs and IVs. [Ref. 7]

D. U.S. ARMY ENLISTMENT PROJECTION MODEL

The U.S. Army uses a linear regression procedure to develop a production forecasting equation for their five Army recruiting brigades and three mission categories. The equations are used to produce a forecast for the next four quarters.

The dependent variables are:

1. I-IIIA Male Market (Seniors + 2 yrs' grads),
2. IIIB Male Market (Seniors + 2 yrs' grads),
3. I-IIIA Female Market (Seniors + 2 yrs' grads).

The independent variables used in the regression forecasting equation are:

1. Army on-production recruiters,
2. Other-service recruiters,
3. Unemployment,
4. Army recruiter experience factor,
5. Army enlistment propensity,
6. Market data,

7. Dummy variable for quarters (seasonality),

8. Dummy variables for battalions within brigades.

The regression procedure produces 15 estimating equations (five brigades times three dependent variables). [Ref. 8] Although the regression model provides a technique for forecasting likely enlistment levels, there is some subjective judgement included in the final decision of goal allocation.

E. PREVIOUS PROPENSITY STUDIES AND THEIR FINDINGS

The Department of Defense sponsors an annual national Youth Attitude Tracking Study (YATS) survey. The purpose of the survey is to gain knowledge about the impact of recruiting and advertising programs, and to estimate current interest in the military service. [Ref. 1:p. 225]

There are two types of questions asked to determine interest in military service. One question could be referred to as "unaided" mention. The question is asked, "What do you think you will be doing in the next few years?" If the respondent states that he intends to join the military service, he is considered to have an unaided mention. Another question directly asks, "How likely is it that you will join the military service in the next few years?" The respondent can answer: definitely will join, probably will join, probably will not join, or definitely will not join. If the respondent answers definitely or probably will join, this is considered to be an "aided"

mention but if he responds with probably will not or definitely will not join, this is considered a negative intention. [Ref. 9:p. 8]

Bruce R. Orvis conducted several studies for The Office of the Assistant Secretary of Defense/Manpower, Installations and Logistics. In his research he attempted to show the extent to which stated intentions on the YATS survey relate to actual enlistments. In Orvis' 1982 study, the data suggested that enlistment intentions measured in the Youth Attitude Tracking Study do a good job of indicating the probability that the respondent actually will apply to enlist. The data also indicated that many Youth Attitude Tracking Study respondents make their enlistment decisions several years after the survey. The predictive power of the Youth Attitude Tracking Study intention measures continues up to 4 years after the respondent answers the survey. The most accurate predictions, however, are obtained within the first 12 to 18 months following the survey. [Ref. 9:p. 8]

In 1985, Orvis continued his research on the relationship between intentions and actual enlistments by evaluating whether this intention information conveys more about an individual's likelihood of enlisting than demographic characteristics. The data suggested that intentions do provide information about an individual's probability to enlist beyond that available from demograpnic factors. Respondents that have the strongest enlistment intentions

(unaided mention and aided mention) have a 37 percent enlistment rate, while respondents that had only positive enlistment intentions (aided mention only) enlisted at a rate of only 15 percent. The negative intention group had only a 5 percent enlistment rate. Though a higher percent of the strongest and positive intention groups enlisted, 46 percent of all enlistees from the sample group were from the negative intention group. Orvis states that a small increase in the enlistment rate of the negative intention group will provide a significant increase in the number of actual enlistees. [Ref. 10]

Based on the findings of Orvis, Gregory D. Citizen conducted research to determine local area estimates of market potential for the Army, Navy, Air Force and Marine Corps, using intention data from the Youth Attitude Tracking Study survey. The local areas used by Citizen equate only to the recruiting area level in the Navy. Therefore, his findings provide no new tool for goal allocation at the district level. His results indicated that the Air Force received highest positive propensity for all ages and for areas, except the southwest and mideast, where the Navy was preferred. In general he found that the propensity to enlist was highest in the southeast followed by the northwest, northeast, west and southwest respectively. The propensity to enlist in the Navy and Marine Corps specifically, was highest in the southeast and southwest.

The Army and Air Force had the highest propensity to enlist in the northwest and southeast. One recommendation made is that further study should be conducted for smaller areas. [Ref. 11]

Jules Borack used Youth Attitude Tracking Study data to develop a profile for the high-quality youth market. The independent variables used followed some of Orvis' early work on "high quality." In his logit analysis of the "high-quality" military market, Borack included as independent variables educational status, number of math and science courses completed in high school, self-reported grade point average, father's education, race and region.

The analysis was conducted in two stages. First, Borack determined the probability that an individual is a member of the "high-quality" group. Second, he estimated the mean value of a trait of "high-AFQT" individuals that intend to join the military. He concluded that his two-stage regression-based technique would be useful for estimating population parameters when group membership is unknown and the services require descriptions of different market sectors. [Ref. 1:p. 226]

F. OBJECTIVE

As stated previously, it is critical that recruiter allocation goals be distributed based on market potential to ensure the greatest possible market penetration. If current recruiter allocation goals are not appropriate across

recruiting districts, it would be beneficial to identify additional variables that will aid in establishing recruiter goal allocation. From previous studies there is a strong indication that a person's stated intentions on the YATS survey provide a strong indication of propensity to enlist. There have been relatively few studies that used intentions to predict enlistment, and of those that have explored this area, none have provided a useful model for predicting new contracts at the Navy recruiting district level. The first step in using intention as a predicting variable for new contracts is to be able to predict intentions for recruiting districts. From this, an intentions "index" could be developed and included in the regression-based forecast of new contracts in the recruiting districts.

The objective is to provide the Navy Recruiting Command with a better tool to distribute goals to the Navy recruiting areas based on forecasts of new contracts in each Navy recruiting district. The districts would be assigned goals that are challenging yet attainable based on the underlying military propensity or "taste" in the area and other demographic characteristics. Recruiting manpower would be less likely to be wasted in areas that have a low potential for enlistment while understaffing areas with higher potential would also be avoided.

II. DESCRIPTION OF DATA FILE

Currently the Youth Attitude Tracking Study survey is administered annually to approximately 5,000 males, 16-to-21 years old, nationally to determine their educational background, work experience, and future plans, including attitudes and intentions about military service. During certain periods the Youth Attitude Tracking Study was administered semi-annually. To obtain a sample size large enough to be representative of the population in the 41 Naval recruiting districts, all the Youth Attitude Tracking Study waves from 1976 to 1984 have been merged into a single file.

The total sample size for the nine year period is 82,013 cases. Blacks represent 12.5 percent of the sample. The question on ethnic background varied from year to year making it impossible to consistently identify ethnic groups other than blacks and whites. Sixty-eight percent of the sample were still in high school at the time they answered the survey. Of those not in high school, 77 percent are high school graduates.

The social security numbers of respondents were matched against the Military Entrance Processing Station (MEP) files to include actual accession data. From the MEP files information was obtained on: Armed Forces Qualification

Test (AFQT), Delayed Entry Program (DEP), Delayed Entry Program discharges and actual accessions.

All waves of the Youth Attitude Tracking Study survey do not contain precisely the same questions. Therefore, it was necessary to recode like questions that could be answered with a similar response and eliminate questions that were not used in all waves of the survey. Fortunately all Youth Attitude Tracking Study surveys used similar phrasing for the intention questions. Most of the questions on education, work, and father's education were the same for most years. Therefore, a large overall sample size could be analyzed on these variables in smaller geographic locations. Appendix B contains the sample sizes for each Navy Recruiting District. The data from the MEPS files are consistent for all years and required no recoding for matches with the Youth Attitude Tracking Study.

III. METHODOLOGY

A. METHODS USED

Several methodologies will be used to analyze the data. First, probabilities of intentions for each district must be determined for: definitely will join, probably will join, probably will not join and definitely will not join the military. The dependent variable, intention, was divided into two groups. The responses "definitely will join" and "probably will join" were combined into "will join," representing the positive propensity group. The responses "probably will not join" and "definitely will not join" were combined into "will not join," representing the negative propensity group. An *intention dummy* variable was created and set equal to 0 for the "will not join" group and equal to 1 for the "will join" group. The independent variables used to predict intentions will be age, education status, number of math courses, self-reported grade point average, father's education, race, and geographic region. Table 3.1 describes the independent variables and the coding used. These are the explanatory variables identified by Orvis, Borack and Citizen to be significant in predicting enlistments. Each Navy recruiting district was recoded as a dummy variable. This produced 40 independent variables for Navy recruiting districts.

TABLE 3.1

DESCRIPTION OF INDEPENDENT VARIABLES

Variable	Description	Code	
AGE	16-21 Year Old Males Non-Prior Service	AGE IN YEARS	
RACE	Ethnic Group	0	WHITE
		1	BLACK
CURSCH	Currently in High School	0	YES
		1	NO
GRADHS	High School Graduate	0	YES
		1	NO
AVGGRD	Average Grade in High School	1	LESS THAN D
		2	Cs AND Ds
		3	Bs AND Cs
		4	As AND Bs
MATH	Number of Math Courses Completed	1	ONE
		2	TWO
		3	THREE
		4	FOUR
FATHER	Father's Highest Education	1	LESS THAN H.S.
		2	HIGH SCHOOL
		3	MORE THAN H.S.
NRD_i	Navy Recruiting District$_i$	0	ALL OTHERS
		1	NRD_i

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

A probit regression was conducted on the independent variables excluding the Navy recruiting districts dummy variables, in three separate year groups. The year groups were 1976-1978, 1979-1980 and 1981-1984. The groups were

determined by the sample size rather than by years, due to the limited capability of the computer package used.

Next, a probit regression was conducted on the independent variables listed previously, for each Navy recruiting area. This produced six separate regression equations. From this an attempt is made to identify an individual's positive or negative intentions to enlist given the information on the independent variables.

Finally, a logit regression was conducted on the independent variables including the Navy recruiting district dummy variables. This model contains 47 independent variables.

B. ESTIMATION PROBLEMS

The SPSSx package was used for all statistical analysis except the final logit regression equation. Due to the large sample sizes and the large number of independent variables a logit or probit regression could not be performed on the full sample with SPSSx. Thus, SAS was used to perform the final logit regression on the full data set (N = 82,013).

IV. RESULTS

A. INTENTION TO JOIN THE MILITARY

The first step in the analysis involved developing a simple cross-tabulation of intention by various demographic attributes. Table 4.1 clearly demonstrates that as age increases intention to join the military decreases. Table 4.2 indicates that non-high school graduates are twice as likely to be interested in the military compared to high school graduates. This table does not include those individuals that were currently in high school.

Table 4.3 indicates that the positive propensity of black males is approximately twice that of white males. Table 4.4 indicates that respondents currently in high school have a significantly higher intention to join the military than those not in high school. This may be attributed to the fact that those not in high school are likely to already have a job, while those still in high school are somewhat uncertain about there future employment.

Table 4.5 presents the propensity to join the military by self-reported average grade in high school. The table shows a general increase in intention to join the military as average grade decreases. Intention of the less than D group is slightly lower than the C's and D's group.

TABLE 4.1

INTENTION TO JOIN THE MILITARY
BY AGE

	Age					
	16	17	18	19	20	21
Will Join	33.7%	29.1%	22.0%	17.0%	14.6%	13.0%

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.2

INTENTION TO JOIN THE MILITARY
BY HIGH SCHOOL GRADUATE STATUS

	High School Graduates	Non-High School Graduates
Will Join	14.8%	31.2%

Source: Derived for data provided by the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.3

INTENTION TO JOIN THE MILITARY
BY RACE

	Race	
	White	Black
Will Join	21.3 %	40.2%

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.4

INTENTION TO JOIN THE MILITARY
BY CURRENT SCHOOL STATUS

	School Status	
	Currently in High School	Currently Not in High School
Will Join	26.4%	19.7%

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.5

INTENTION TO JOIN THE MILITARY
BY SELF-REPORTED AVERAGE GRADE
IN HIGH SCHOOL

	Average Grade			
	A's & B's	B's & C's	C's & D's	Less than D
Will Join	16.6%	26.2%	32.4%	31.3%

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

Table 4.6 indicates that as the number of math courses completed increase, the lower the intention to join the military. (There may be some correlation between the number of math courses completed and the self-reported average grade.)

Table 4.7 indicates that father's education level may have some influence on intention to join the military. The

table shows an increase in intention to join the military as the father's education level decreases.

TABLE 4.6

INTENTION TO JOIN THE MILITARY
BY NUMBER OF MATH COURSES COMPLETED

	Number of Math Courses			
	One	Two	Three	Four
Will Join	29.5%	24.5%	18.8%	13.7%

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.7

INTENTION TO JOIN THE MILITARY
BY FATHER'S HIGHEST LEVEL OF EDUCATION

	Father's Level of Education		
	Less than High School	High School	Greater than High School
Will Join	31.3%	24.8%	18.7%

Source: Derived from data provided by the Youth Attitude Tracking Study, 1976-1984.

Table 4.8 presents the percentage of respondents with a general interest in joining the military (for all services) by Navy district. The table also presents the propensity for each Navy recruiting district by different year group. Years are grouped together to provide a sufficient sample

TABLE 4.8

INTENTION TO JOIN THE MILITARY
FOR NAVY RECRUITING DISTRICTS BY YEAR
(Number Will Join)
(Percent Will Join)

	Years			
	1976-1978	1979-1980	1981-1984	ALL YEARS
Navy Recruiting Districts				
Albany	175 26.7%	154 21.4%	111 22.8%	440 23.6%
Boston	346 30.1%	348 24.5%	156 22.9%	850 26.2%
Buffalo	170 24.2%	256 24.1%	102 27.5%	528 24.7%
New York	197 21.2%	206 16.7%	102 21.7%	491 19.2%
Philadelphia	239 24.1%	264 20.4%	64 17.1%	567 21.3%
New Jersey	157 23.5%	211 20.7%	70 21.8%	438 21.8%
Montgomery	129 34.1%	104 27.3%	100 36.0%	333 32.1%
Columbia	168 36.6%	211 31.1%	86 30.5%	465 32.8%
Jacksonville	254 35.6%	247 28.8%	105 26.9%	606 30.9%
Atlanta	168 30.8%	224 29.1%	73 24.6%	465 26.8%
Nashville	118 29.6%	107 25.2%	109 28.6%	334 27.7%
Raleigh	194 33.6%	216 32.0%	187 36.1%	597 33.7%

TABLE 4.8 (CONTINUED)

Navy Recruiting Districts	Years 1976-1978	1979-1980	1980-1984	ALL YEARS
Richmond	66 24.0%	103 27.6%	49 23.7%	218 25.5%
Miami	121 32.5%	119 31.2%	81 27.4%	321 30.6%
Harrisburg	171 27.3%	116 21.2%	90 22.2%	377 23.9%
District of Columbia	300 27.6%	361 26.3%	107 29.2%	768 27.1%
Cleveland	116 22.5%	117 18.8%	119 31.5%	352 23.2%
Columbus	186 26.7%	167 20.1%	126 26.1%	479 23.8%
Pittsburgh	183 25.2%	203 20.1%	72 27.0%	458 22.9%
Michigan	188 24.7%	183 20.7%	93 19.2%	464 21.8%
Glenview	227 19.6%	310 20.3%	100 21.9%	637 20.3%
St Louis	144 25.7%	146 22.8%	101 27.2%	391 24.9%
Louisville	202 23.1%	299 25.2%	119 27.5%	620 24.9%
Kansas City	111 20.5%	162 20.1%	51 22.8%	324 20.6%
Minneapolis	211 22.6%	211 18.0%	101 20.4%	523 20.1%
Omaha	286 23.0%	283 18.0%	107 22.2%	676 20.5%

TABLE 4.8 (CONTINUED)

Navy Recruiting District	Years 1976-1978	1979-1980	1981-1984	ALL YEARS
Indianapolis	90 23.4%	75 18.6%	87 24.8%	252 22.1%
Milwaukee	187 19.0%	257 19.5%	40 17.2%	484 19.1%
Denver	146 23.6%	135 21.4%	51 19.9%	332 22.1%
Albuquerque	159 34.0%	234 27.2%	114 27.5%	507 29.1%
Dallas	115 27.0%	92 21.2%	139 20.4%	346 22.4%
Houston	100 29.2%	134 23.5%	72 26.5%	306 28.0%
Little Rock	149 25.8%	161 23.5%	89 22.3%	399 24.0%
New Orleans	315 28.0%	441 26.3%	116 26.2%	872 26.9%
San Antonio	95 32.6%	113 31.5%	67 27.3%	275 30.7%
Memphis	135 34.9%	151 31.1%	136 34.5%	422 33.3%
Los Angeles	147 22.3%	149 18.9%	73 19.9%	369 20.4%
Portland	148 23.2%	149 19.7%	186 26.7%	483 23.1%
San Francisco	209 21.8%	209 18.5%	132 20.9%	550 20.2%
Seattle	136 23.9%	162 19.7%	91 19.2%	389 20.9%

TABLE 4.8 (CONTINUED

Navy Recruiting Districts	Years 1976-1978	1979-1980	1981-1984	ALL YEARS
San Diego	130 28.8%	97 20.7%	92 21.1%	319 23.5%
Missing or Unidentified	61	137	15	213
Total	7,149 25.9%	8,024 22.8%	4,067 24.7%	19,204 24.2%

Source: Based on data provided by the Youth Attitude Tracking Study, 1976-1984.

size to determine propensity at the district level. An analysis of variance indicates that there is a significant difference between year groups. There appears to be no consistent pattern of change for all Navy recruiting districts. For some districts there has been a slight continuous increase, for others a slight continuous decrease or a slight up and down shift in propensity.

The last column of Table 4.8 provides the propensity for all nine years for each Navy recruiting district. Across all Navy recruiting districts the propensity to join the military ranges from a low of 19.2 percent in New York City, New York to a high of 33.7 percent in Raleigh, North Carolina.

After missing cases or unidentified cases were removed there were 79,354 respondents in the sample that could be matched with a specific Navy recruiting district. Of the total respondents, 19,240 indicated a positive intention to join the military. The national average of propensity to join the military was calculated to be 24.2 percent.

Table 4.9 contains the propensity index of general intention to join the military by Navy recruiting areas and by districts. The national average of intention to join the military is 24.2 percent. The second column provides the total sample size for the indicated area or district. Column three, provides the propensity to join the military for each area and district. The last column gives the calculated propensity index for each area and district. The ratio is calculated by dividing the percent intend to join by the percent national average. The ratio is multiplied by 100 to obtain the index for each area and district.

The highest propensity index for Navy recruiting areas is in the southeast (126.5) and the southwest (110.3). As stated previously the same results were found by Citizen. However, considerable variation in propensity is observed within Navy recruiting areas. For example, in the New England area positive propensity averages 94.628, but varies from a low of 79.339, 16 percent below the average, to a high of 108.264, 14 percent above the average.

TABLE 4.9

PROPENSITY INDEX OF GENERAL INTENTION TO JOIN THE MILITARY
BY NAVY RECRUITING AREA AND DISTRICT

Navy Recruiting District/Area	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
Area 1 New England	14,472	0.229	0.242	0.946	94.62
Albany	1,862	0.236	0.242	0.975	97.52
Boston	3,250	0.262	0.242	1.083	108.26
Buffalo	2,137	0.247	0.242	1.021	102.07
New York	2,559	0.192	0.242	0.793	79.34
Philadelphia	2,658	0.213	0.242	0.880	88.01
New Jersey	2,006	0.218	0.242	0.901	90.08
Area 3 Southeast	10,910	0.306	0.242	1.264	126.45
Montgomery	1,037	0.321	0.242	1.326	132.65
Columbia	1,419	0.328	0.242	1.355	135.54
Jacksonville	1,963	0.309	0.242	1.277	127.69
Atlanta	1,613	0.288	0.242	1.190	119.01
Nashville	1,204	0.277	0.242	1.145	114.46
Raleigh	1,770	0.337	0.242	1.393	139.26
Richmond	855	0.255	0.242	1.054	105.37
Miami	1,049	0.306	0.242	1.264	126.45
Area 4 Northeast	12,068	0.306	0.242	0.992	99.174
Harrisburg	1,580	0.239	0.242	0.988	98.76
Wash. D.C.	2,829	0.271	0.242	1.119	111.98
Cleveland	1,516	0.232	0.242	0.959	95.89
Columbus	2,010	0.238	0.242	0.983	98.35
Pittsburgh	2,004	0.229	0.242	0.946	94.63
Michigan	2,129	0.218	0.242	0.901	90.08

TABLE 4.9 (CONTINUED)

Navy Recruiting District/Area	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
Area 5					
Midwest	18,348	0.213	0.242	0.880	88.02
Glenview	3,143	0.203	0.242	0.839	83.88
St. Louis	1,572	0.249	0.242	1.029	102.89
Louisville	2,492	0.249	0.242	1.029	102.89
Kansas City	1,573	0.206	0.242	0.851	85.12
Minneapolis	2,602	0.201	0.242	0.831	83.06
Omaha	3,295	0.205	0.242	0.847	84.71
Indianapolis	1,139	0.221	0.242	0.913	91.32
Milwaukee	2,532	0.191	0.242	0.789	78.93
Area 7					
Southwest	12,948	0.267	0.242	1.103	110.331
Denver	1,504	0.221	0.242	0.913	91.32
Albuquerque	1,742	0.291	0.242	1.202	120.25
Dallas	1,543	0.224	0.242	0.926	92.56
Houston	1,091	0.280	0.242	1.157	115.70
Little Rock	1,663	0.240	0.242	0.992	99.16
New Orleans	3,244	0.269	0.242	1.112	111.16
San Antonio	895	0.307	0.242	1.269	126.86
Memphis	1,266	0.333	0.242	1.376	137.60
Area 8					
West	9,843	0.214	0.242	0.884	88.43
Los Angeles	1,813	0.204	0.242	0.843	84.29
Portland	2,090	0.231	0.242	0.955	95.46
San Francis.	2,718	0.202	0.242	0.835	83.47
Seattle	1,864	0.209	0.242	0.854	86.36
San Diego	1,358	0.235	0.242	0.971	97.11

Source: Developed from data from the Youth Attitude Tracking Study, 1976-1984.

A t-test indicates that there is significant evidence of a difference in the percent national average and the area percent intend to join for the New England, Southeast, Midwest, Southwest and West recruiting areas. The Northeast recruiting area indicated no significant difference between area percent intend to join and the percent national average.

As a comparison the same procedure was applied on Army recruiting battalions (N=56) and brigades (N=5). Table 4.10 provides the results for Army battalions and brigades. This table indicates that the propensity index is the highest in the southeast (2nd Brigade) and the southwest (5th Brigade). Citizen found the highest propensity for the Army to be in the southeast and the northeast (1st brigade). Substantial variation across recruiting battalions within brigades is also observed for the Army.

B. SPECIFIC INTENTION TO JOIN THE NAVY

In the tables above the calculated propensity refers to all services. Table 4.11 provides the propensity index of intention to join the Navy by Navy recruiting areas and districts. The total sample size was 79,242, with 10,952 indicating a positive propensity to join the Navy. The national average Navy propensity was calculated to be 13.8 percent. Once again note the Navy propensity index is highest in the southeast and the southwest recruiting areas.

TABLE 4.10

PROPENSITY INDEX OF GENERAL INTENTION TO JOIN THE MILITARY
BY ARMY RECRUITING BATTALION AND BRIGADE

Army Recruiting Brigades/ Battalions	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
1st Brigade	20,734	0.235	0.242	0.971	97.11
Albany	679	0.236	0.242	0.975	97.52
Baltimore	2,938	0.271	0.242	1.120	111.98
Boston	2,191	0.233	0.242	0.963	96.28
Brunswick	987	0.317	0.242	1.310	130.99
Harrisburg	1,609	0.239	0.242	0.988	98.76
New Haven	1,427	0.245	0.242	1.012	101.24
Long Island	1,812	0.199	0.242	0.822	82.23
Newburgh	1,508	0.180	0.242	0.744	74.38
Ft Monmouth	1,492	0.235	0.242	0.971	97 11
Philadalphia	2,568	0.212	0.242	0.876	87.60
Pittsburgh	2,268	0.227	0.242	0.938	93.80
Syracuse	2,003	0.251	0.242	1.037	103.72
2nd Brigade	13,446	0.295	0.242	1.219	121.90
Atlanta	1,664	0.288	0.242	1.190	119.01
Beckley	896	0.278	0.242	1.149	114.88
Charlotte	965	0.333	0.242	1.376	137.60
Columbia	1,505	0.333	0.242	1.376	137.60
Jacksonville	1,985	0.310	0.242	1.281	128.10
Louisville	1,658	0.233	0.242	0.963	96.28
Miami	1,159	0.305	0.242	1.260	126.03
Montgomery	1,081	0.321	0.242	1.326	132.64
Nashville	1,253	0.277	0.242	1.145	114.46
Raleigh	828	0.338	0.242	1.397	139.67
Richmond	881	0.256	0.242	1.058	105.79
4th Brigade	18,318	0.211	0.242	0.872	87.19
Chicago	2,062	0.203	0.242	0.839	83.88
Cincinnati	1,020	0.242	0.242	1.000	100.00
Cleveland	1,558	0.232	0.242	0.959	95.87
Columbus	1,079	0.235	0.242	0.971	97.11
Des Moines	2,164	0.212	0.242	0.876	87.60
Detroit	1,172	0.204	0.242	0.843	84.30
Indianapolis	1,028	0.227	0.242	0.938	93.80
Lansing	960	0.227	0.242	0.938	93.80
Milwaukee	2,596	0.191	0.242	0.789	78.93
Minneapolis	2,282	0.192	0.242	0.793	79.34
Omaha	1,606	0.208	0.242	0.860	85.95
Peoria	1,409	0.206	0.242	0.851	85.12

TABLE 4.10 (CONTINUED)

Army Recruiting Brigades/ Battalions	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
5th Brigade	16,139	0.259	0.242	1.070	107.02
Albuquerque	1,554	0.298	0.242	1.231	123.14
Dallas	1,612	0.224	0.242	0.926	92.56
Denver	1,547	0.221	0.242	0.913	91.32
Houston	1,117	0.280	0.242	1.157	115.70
Jackson	1,312	0.333	0.242	1.376	137.60
Kansas City	1,615	0.206	0.242	0.851	85.12
Little Rock	1,881	0.267	0.242	1.103	110.33
New Orleans	2,213	0.262	0.242	1.083	108.26
Oklahoma City	1.194	0.238	0.242	0.983	98.35
San Antonio	916	0.307	0.242	1.269	126.86
St. Louis	1,624	0.248	0.242	1.025	102.48
6th Brigade	9,846	0.214	0.242	0.884	88.43
San Francis.	1,477	0.185	0.242	0.764	76.45
Los Angeles	1,590	0.205	0.242	0.847	84.71
Phoenix	735	0.255	0.242	1.054	105.37
Portland	1,107	0.243	0.242	1.004	100.41
Sacramento	1,340	0.222	0.242	0.917	91.74
Salt Lake Cy	1,403	0.230	0.242	0.950	95.04
Santa Ana	1,001	0.207	0.242	0.855	85.54
Seattle	1,562	0.196	0.242	0.810	80.99

Source: Developed from data from the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.11

PROPENSITY INDEX OF INTENTION TO JOIN THE NAVY
BY NAVY RECRUITING AREA AND DISTRICT

Navy Recruiting District/Area	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
Area 1					
New England	14,444	0.125	0.138	0.904	90.42
Albany	1,804	0.137	0.138	0.993	99.28
Boston	3,247	0.152	0.138	1.101	110.14
Buffalo	2,131	0.128	0.138	0.928	92.75
New York	2,584	0.089	0.138	0.645	64.49
Philadelphia	2,644	0.125	0.138	0.906	90.58
New Jersey	2,034	0.116	0.138	0.841	84.06
Area 3					
Southeast	10,969	0.172	0.138	1.246	124.64
Montgomery	1,052	0.167	0.138	1.210	121.01
Columbia	1,438	0.204	0.138	1.478	147.83
Jacksonville	1,952	0.160	0.138	1.159	115.94
Atlanta	1,621	0.185	0.138	1.341	134.06
Nashville	1,218	0.129	0.138	0.935	93.48
Raleigh	1,779	0.187	0.138	1.355	135.51
Richmond	866	0.142	0.138	1.029	102.89
Miami	1,043	0.184	0.138	1.333	133.33
Area 4					
Northeast	11,941	0.134	0.138	0.971	97.101
Harrisburg	1,547	0.184	0.138	1.333	133.33
Wash. D.C.	2,744	0.145	0.138	1.051	105.07
Cleveland	1,503	0.121	0.138	0.877	87.68
Columbus	2,035	0.140	0.138	1.014	101.45
Pittsburgh	2,011	0.120	0.138	0.870	87.96
Michigan	2,101	0.124	0.138	0.899	89.86

TABLE 4.11 (CONTINUED)

Navy Recruiting District/Area	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
Area 5 Midwest	18,298	0.122	0.138	0.884	88.41
Glenview	3,085	0.120	0.138	0.870	86.96
St. Louis	1,572	0.141	0.138	1.022	102.17
Louisville	2,497	0.136	0.138	0.986	98.55
Kansas City	1,573	0.123	0.138	0.891	89.13
Minneapolis	2,599	0.123	0.138	0.891	89.13
Omaha	3,317	0.119	0.138	0.862	86.23
Indianapolis	1,141	0.122	0.138	0.884	88.41
Milwaukee	2,514	0.103	0.138	0.746	74.64
Area 7 Southwest	12,990	0.155	0.138	1.123	112.32
Denver	1,509	0.133	0.138	0.964	96.38
Albuquerque	1,742	0.164	0.138	1.188	118.84
Dallas	1,567	0.124	0.138	0.899	89.86
Houston	1,083	0.172	0.138	1.246	124.64
Little Rock	1,681	0.136	0.138	0.986	98.55
New Orleans	3,245	0.175	0.138	1.268	126.81
San Antonio	895	0.145	0.138	1.051	105.07
Memphis	1,268	0.174	0.138	1.261	126.09
Area 8 West	9,837	0.132	0.138	0.957	95.65
Los Angeles	1,825	0.136	0.138	0.986	98.55
Portland	2,097	0.142	0.138	1.029	102.89
San Francis.	2,694	0.120	0.138	0.870	86.96
Seattle	1,857	0.125	0.138	0.906	90.58
San Diego	1,364	0.143	0.138	1.036	103.62

Source: Developed from data from the Youth Attitude Tracking Study, 1976-1984.

A t-test indicates that there is significant evidence of a difference in the percent national average and the area percent intend to join for the New England, Southeast, Midwest and Southwest recruiting areas. The Northeast and West recruiting areas indicated no significant difference between area percent intend to join and the percent national average.

Table 4.12 provides a comparison of the propensity index for general intention versus Navy intention by Navy recruiting areas and districts. The simple correlation coefficient between the two propensity indexes is +.835, which is statistically significant. This positive correlation indicates that general military propensity is highly correlated with Navy propensity in most districts and could serve as a proxy for it.

Table 4.13 provides a comparison between the coefficients of variation for general propensity index and for the Navy propensity index. Compared to general propensity there is a larger variance for Navy propensity in the New England, Southeast, West and Northeast areas. The variance for the Midwest and Southeast areas is lower, however, the difference is only 1 percent and 1.3 percent lower, respectively. Though there appears to be greater variation between Navy recruiting districts and between Navy recruiting districts within areas for Navy propensity, the variation for general propensity between Navy recruting

TABLE 4.12

COMPARISON OF MILITARY PROPENSITY INDEX
AND NAVY PROPENSITY INDEX
BY NAVY RECRUITING AREA AND DISTRICT

Navy Recruiting Area/District	Propensity Index General Intention	Propensity Index Navy Intention
Area 1		
New England	94.6	90.4
Albany	97.5	99.3
Boston	108.3	110.1
Buffalo	102.1	92.8
New York	79.3	64.5
Philadelphia	88.0	90.6
New Jersey	90.1	84.1
Area 3		
Southeast	126.4	124.6
Montgomery	132.6	121.0
Columbia	135.5	147.8
Jacksonville	127.7	115.9
Atlanta	119.0	134.1
Nashville	114.5	93.5
Raleigh	139.3	135.5
Richmond	105.4	102.9
Miami	126.4	133.3
Area 4		
Northeast	99.2	97.1
Harrisburg	98.8	133.3
District of Columbia	111.9	105.1
Cleveland	95.9	87.7
Columbus	98.3	101.4
Pittsburgh	94.6	86.9
Michigan	90.1	89.9

TABLE 4.12 (CONTINUED)

Navy Recruiting Area/District	Propensity Index General Intention	Propensity Index Navy Intention
Area 5		
Midwest	88.0	88.4
Glenview	83.9	86.9
St. Louis	102.9	102.2
Louisville	102.9	98.6
Kansas City	85.1	89.1
Minneapolis	83.1	89.1
Omaha	84.7	86.2
Indianapolis	91.3	88.4
Milwaukee	78.9	74.6
Area 7		
Southeast	110.3	112.3
Denver	91.3	96.4
Albuquerque	120.2	118.8
Dallas	92.6	89.9
Houston	115.7	124.6
Little Rock	99.2	98.6
New Orleans	111.2	126.8
San Antonio	126.9	105.1
Memphis	137.6	126.1
Area 8		
West	88.4	95.7
Los Angeles	84.3	98.6
Portland	95.5	102.9
San Francisco	83.5	86.9
Seattle	86.4	90.6
San Diego	97.1	103.6
Correlation Coefficient	+.835	

Source: Developed from data provided by the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.13

COEFFICIENT OF VARIATION OF PROPENSITY INDEX

	General Propensity Index	Navy Propensity Index
Coefficient of Variance Between Navy Recruiting Districts by Areas		
New England	11.1%	17.1%
Southeast	9.1%	14.8%
Northeast	7.5%	17.5%
Midwest	10.3%	9.3%
Southwest	14.8%	13.5%
West	7.2%	7.7%
Coefficient of Variance Between Navy Recruiting Areas	14.7%	13.9%
Coefficient of Variance Between Navy Recruiting Districts	16.9%	18.0%

Source: Developed from data provided from the Youth Attitude Tracking Study, 1976-1984.

areas is lower than that between Navy recruiting areas. There is a greater variation between districts than there is between areas for both general and Navy propensity.

C. SPECIFIC INTENTION TO JOIN THE ARMY

Table 4.14 presents the propensity index of intention to join the Army by Army recruiting battalions and brigades. The sample size was 79,240, with 10,325 indicating positive intention to join the Army. The national average positive Army propensity was 13.0 percent. As indicated in Table

TABLE 4.14

PROPENSITY INDEX OF INTENTION TO JOIN THE ARMY
BY ARMY RECRUITING BATTALION AND BRIGADE

Army Recruiting Brigades/ Battalions	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
1st Brigade	20,734	0.116	0.13	0.892	89.23
Albany	646	0.149	0.13	1.146	114.62
Baltimore	2,754	0.136	0.13	1.046	104.62
Boston	2,124	0.107	0.13	0.823	82.31
Brunswick	964	0.168	0.13	1.292	129.23
Harrisburg	1,536	0.133	0.13	1.023	102.31
New Haven	1,320	0.120	0.13	0.923	92.31
Long Island	1,773	0.074	0.13	0.569	56.92
Newburgh	1,448	0.088	0.13	0.677	67.69
Ft Monmouth	1,456	0.111	0.13	0.854	85 38
Philadalphia	2,586	0.091	0.13	0.700	70.00
Pittsburgh	2,197	0.123	0.13	0.946	94.62
Syracuse	1,930	0.131	0.13	1.008	100.77
2nd Brigade	13,446	0.179	0.13	1.377	137.69
Atlanta	1,622	0.186	0.13	1.431	143.08
Beckley	871	0.186	0.13	1.431	143.08
Charlotte	937	0.203	0.13	1.562	156.15
Columbia	1,470	0.235	0.13	1.808	180.77
Jacksonville	1,898	0.171	0.13	1.315	131.54
Louisville	1,619	0.145	0.13	1.115	111.54
Miami	1,096	0.163	0.13	1.254	125.38
Montgomery	1,050	0.165	0.13	1.269	126.92
Nashville	1,214	0.152	0.13	1.169	116.92
Raleigh	805	0.234	0.13	1.800	180.00
Richmond	861	0.154	0.13	1.185	118.46
4th Brigade	18,318	0.116	0.13	0.892	89.23
Chicago	1,977	0.102	0.13	0.785	78.46
Cincinnati	978	0.140	0.13	1.077	107.69
Cleveland	1,510	0.116	0.13	0.892	89.23
Columbus	1,053	0.134	0.13	1.031	103.08
Des Moines	2,133	0.120	0.13	0.923	92.31
Detroit	1,140	0.096	0.13	0.738	73.85
Indianapolis	987	0.127	0.13	0.977	97.69
Lansing	892	0.120	0.13	0.923	92.31
Milwaukee	2,517	0.099	0.13	0.762	76.15
Minneapolis	2,217	0.102	0.13	0.785	78.46
Omaha	1,581	0.135	0.13	1.038	103.85
Peoria	1,333	0.133	0.13	1.023	102.31

TABLE 4.14 (CONTINUED)

Army Recruiting Brigades/ Battalions	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
5th Brigade	16,139	0.146	0.13	1.123	112.31
Albuquerque	1,525	0.153	0.13	1.177	117.69
Dallas	1,566	0.130	0.13	1.000	100.00
Denver	1,520	0.091	0.13	0.700	70.00
Houston	1,079	0.157	0.13	1.208	120.77
Jackson	1,269	0.206	0.13	1.585	158.46
Kansas City	1,575	0.108	0.13	0.831	83.08
Little Rock	1,836	0.181	0.13	1.392	139 23
New Orleans	2,124	0.159	0.13	1.223	122.31
Oklahoma City	1,172	0.135	0.13	1.038	103.85
San Antonio	896	0.158	0.13	1.215	121.54
St. Louis	1,577	0.139	0.13	1.069	106.92
6th Brigade	9,846	0.095	0.13	0.731	73.08
San Francis.	1,411	0.076	0.13	0.585	58.46
Los Angeles	1,513	0.106	0.13	0.815	81.54
Phoenix	711	0.110	0.13	0.846	84.62
Portland	1,087	0.099	0.13	0.762	76.15
Sacramento	1,285	0.107	0.13	0.823	82.31
Salt Lake Cy	1,363	0.101	0.13	0.777	77.69
Santa Ana	970	0.082	0.13	0.631	63.08
Seattle	1,502	0.081	0.13	0.623	62.31

Source: Developed from data from the Youth Attitude Tracking Study, 1976-1984

4.14 the highest Army positive propensity index is in the southeast and the southwest.

Table 4.15 compares the propensity index for general military intention versus Army intention by Army recruiting battalions and brigades. The simple correlation coefficient between the two propensity indexes is +.885, which is statistically significant. This correlation indicates that

TABLE 4.15

COMPARISON OF MILITARY PROPENSITY INDEX AND ARMY PROPENSITY INDEX BY ARMY RECRUITING BATTALION AND BRIGADE

Army Recruiting Battalions/Brigades	Propensity Index General Intention	Propensity Index Army Intention
1st Brigade	97.1	89.2
Albany	97.5	114.6
Baltimore	111.9	104.6
Boston	96.3	82.3
Brunswick	130.9	129.2
Harrisburg	98.8	102.3
New Haven	101.2	92.3
Long Island	82.2	56.9
Newburgh	74.4	67.7
Ft. Monmouth	97.1	85.4
Philadelphia	87.6	70.0
Pittsburgh	93.8	94.6
Syracuse	103.7	100.8
2nd Brigade	121.9	137.7
Atlanta	119.0	143.0
Beckley	114.9	143.0
Charlotte	137.6	156.1
Columbia	137.6	180.8
Jacksonville	128.1	131.5
Louisville	96.3	111.5
Miami	126.0	125.4
Montgomery	132.6	126.9
Nashville	114.5	116.9
Raleigh	139.7	180.0
Richmond	105.8	118.5

TABLE 4.15 (CONTINUED)

Army Recruiting Battalion/Brigade	Propensity Index General Intention	Propensity Index Army Intention
4th Brigade	87.1	89.2
Chicago	83.9	78.5
Cincinnati	100.0	107.7
Cleveland	95.9	89.2
Columbus	97.1	103.1
Des Moines	87.6	92.3
Detroit	84.3	73.9
Indianapolis	93.8	97.7
Lansing	93.8	92.3
Milwaukee	78.9	76.2
Minneapolis	79.3	78.5
Omaha	85.9	103.9
Peoria	85.1	102.3
5th Brigade	107.0	112.3
Albuquerque	123.1	117.7
Dallas	92.6	100.0
Denver	91.3	70.0
Houston	115.7	120.8
Jackson	137.6	158.5
Kansas City	85.1	83.1
Little Rock	110.3	139.2
New Orleans	108.3	122.3
Oklahoma City	98.4	103.9
San Antonio	126.9	121.5
St. Louis	102.5	106.9
6th Brigade	88.4	73.1
San Francisco	76.5	58.5
Los Angeles	84.7	81.5
Phoenix	105.4	76.2
Portland	100.4	76.2
Sacramento	91.7	82.3
Salt Lake City	95.0	77.7
Santa Ana	85.5	63.1
Seattle	81.0	62.3
Correlation Coefficient	+.885	

Source: Developed from data from the Youth Attitude Tracking Study, 1976-1984.

general military propensity is highly correlated with Army propensity in most battalions and could serve as a proxy for it.

D. INTENTION TO JOIN THE MILITARY BY STATE

Table 4.16 provides the propensity index of intention to join the military by states. This does not provide any information that could be used with the current Army or Navy recruiting command structure, however, it may be of interest in the future if boundaries are changed.

E. LOGIT/PROBIT ANALYSIS

A probit regression analysis was conducted on the independent variables, excluding the Navy recruiting districts dummy variables. Due to the large sample size the probit analysis could not be completed for all years combined. Thus, separate probit regressions were estimated on three separate year groups. The groupings were not determined by the number of years, but by the sample size within each group. However, it might be expected that differences in propensity would emerge if trends are present in the data. Table 4.17 provides the sample size of each group.

Table 4.17 provides the regression coefficients for the three year groups. The signs of the coefficient models are the same for the three year groups. As age increases, the lower the probability of the intention to join the military.

TABLE 4.16

PROPENSITY INDEX OF GENERAL INTENTIONS
TO JOIN THE MILITARY BY STATE

State	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
Alabama	1,109	0.296	0.242	1.223	122.31
Arizona	623	0.252	0.242	1.041	104.12
Arkansas	863	0.277	0.242	1.145	114.46
California	5,269	0.207	0.242	0.855	85.54
Colorado	1,340	0.213	0.242	0.880	88.02
Connecticut	1,083	0.234	0.242	0.967	96.69
Delaware	347	0.291	0.242	1.202	120.25
Wash. D.C.	343	0.329	0.242	1.360	135.95
Florida	3,025	0.332	0.242	1.372	137.19
Georgia	2,319	0.297	0.242	1.227	122.73
Idaho	418	0.244	0.242	1.008	100.83
Illinois	3,955	0.208	0.242	0.860	85.95
Indiana	1,660	0.228	0.242	0.942	94.22
Iowa	2,180	0.207	0.242	0.855	85.54
Kansas	828	0.199	0.242	0.822	82.23
Kentucky	1,862	0.251	0.242	1.037	103.72
Louisiana	3,320	0.268	0.242	1.107	110.74
Maine	622	0.333	0.242	1.376	137.60
Maryland	2,047	0.257	0.242	1.062	106.19
Massachusett	2,106	0.238	0.242	0.983	98.34
Michigan	2,340	0.215	0.242	0.888	88.84
Minnesota	2,001	0.194	0.242	0.802	80.16
Mississippi	773	0.344	0.242	1.421	142.15
Missouri	1,707	0.240	0.242	0.992	99.17
Montana	363	0.262	0.242	1.083	108.26
Nebraska	660	0.180	0.242	0.744	74.38
Nevada	131	0.237	0.242	0.979	97.93
New Hampshire	338	0.287	0.242	1.186	118.60
New Jersey	2,637	0.218	0.242	0.901	90.08
New Mexico	759	0.329	0.242	1.360	135.95
New York	5,159	0.216	0.242	0.893	89.26
No. Carolina	1,680	0.335	0.242	1.384	138.43
North Dakota	291	0.230	0.242	0.950	95.04

TABLE 4.16 (CONTINUED)

State	N	Percent Intend to Join	Percent National Average	Ratio	Index (Ratio X 100)
Ohio	3,316	0.231	0.242	0.955	95.45
Oklahoma	956	0.240	0.242	0.992	99.17
Oregon	1,014	0.243	0.242	1.004	100.41
Pennsylvania	5,161	0.225	0.242	0.930	92.98
Rhode Island	313	0.256	0.242	1.058	105.79
So. Carolina	1,089	0.345	0.242	1.426	142.56
South Dakota	259	0.251	0.242	1.037	103.72
Tennessee	1,017	0.283	0.242	1.169	116.94
Texas	4,348	0.261	0.242	1.079	107.85
Utah	605	0.215	0.242	0.888	88.84
Vermont	173	0.306	0.242	1.264	126.44
Virginia	1,569	0.252	0.242	1.041	104.13
Washington	1,552	0.193	0.242	0.798	79.75
W. Virginia	909	0.272	0.242	1.124	112.40
Wisconsin	2,697	0.194	0.242	0.802	80.17
Wyoming	116	0.302	0.242	1.248	124.79
Missing or Unidentified	96				
Total	79,354				

Source: Developed from data from the Youth Attitude Tracking Study, 1976-1984.

TABLE 4.17

PROBIT COEFFICIENTS BY YEAR
(t statistic)

	YEARS		
	1976-1978	1979-1980	1981-1984
Variable			
Intercept	8.474 (39.2)***	7.899 (43.5)***	7.509 (35.1)***
Age	-.197 (-18.2)***	-.158 (-17.4)***	-.134 (-12.7)***
Race	.404 (10.8)***	.399 (12.5)***	.477 (12.9)***
Cursch	.154 (2.9)***	.151 (3.1)***	.208 (3.6)***
Gradhs	.212 (3.8)***	.167 (3.4)***	.252 (3.6)***
Avggrd	-.129 (-6.7)***	-.217 (-12.9)***	-.272 (-12.8)***
Math	-.112 (-9.1)***	-.070 (-8.5)***	-.064 (-5.8)***
Father	-.154 (-9.2)***	-.125 (-8.5)***	-.099 (-5.8)***
N	27,619	25,150	26,585

*** Statistically significant at the .01 level.

Source: Developed from data extracted from the Youth Attitude Tracking Study, 1976-1984.

This is consistent with the simple cross-tabulation displayed in Table 4.1. If a respondent is black he will be more likely to have a positive propensity to join the military. Table 4.3 indicated that blacks were almost twice as likely to have positive intentions to join the military. If the respondent is not currently in school the results indicate an increase in his military propensity. This shows that for individuals of a given age, currently in school has a positive coefficient. This clearly indicates that age and currently in school are highly correlated. A non-high school graduate is likely to have a higher propensity to join the services, which is consistent with Table 4.2. As the average grade in high school increases, the positive enlistment intentions also decreases. This can be confirmed with the results from Table 4.5. Similarly, as the number of math courses taken in high school increases the propensity for enlistment intentions decreases. This confirms the bivariate results in Table 4.6. Finally, as the respondent's father's education level increases, the results indicate there will be a decrease in the positive propensity.

The probit equations were highly significant for all year groups. Appendix C contains the contingency tables, comparing actual and predicted intention to join the military by year groupings. The probit model correctly

classifies approximately two-thirds of all cases in each year group.

The same model was then run with the additon of Navy recruiting districts as independent variables. Again the sample size would not allow the model to be run as a simple probit regression. The model was run separately for the six Navy recruiting areas. Table 4.18 contains the results of the probit estimations for the six Navy recruiting areas. The signs for the independent variables are consistent with the results contained in Table 4.17. However, the magnitude of the coefficients vary across areas. There is a 1.2 variation between the smallest and largest area intercept. There is only a slight ariation between the smallest and largest intercept in the number of math courses completed and father's highest level of education, .07 and .04 respectively, but a large variation in race of .357. Currrent high school status , average grades in high school and high school graduate status varied between .1 and .2 across areas. The base case Navy recruiting district for each area is as follows:

1. Area 1 Philadelphia Recruiting District
2. Area 3 Jacksonville Recruiting District
3. Area 4 District of Columbia Recruiting District
4. Area 6 Omaha Recruiting District
5. Area 7 New Orleans Recruiting District
6. Area 8 San Francisco Recruiting District.

TABLE 4.18

PROBIT COEFFICIENTS BY NAVY RECRUITING AREA
(t statistic)

	Navy Recruiting Areas					
	1	3	4	5	7	8
Variable						
Intercept	7.437 (26.7) ***	7.758 (25.8) ***	7.816 (26.2) ***	8.654 (34.6) ***	7.577 (26.2) ***	7.977 (22.5) ***
Age	-.149 (-10.9) ***	-.151 (10.1) ***	-.144 (-9.8) ***	-.196 (-15.7) ***	-.147 (-10.2) ***	-.164 (-9.5) ***
Race	.406 (7.6) ***	.506 (11.2) ***	.324 (6.1) ***	.366 (6.5) ***	.464 (10.6) ***	.149 (1.7) **
Cursch	.223 (2.7) ***	.241 (3.5) ***	.052 (0.7)	.105 (1.7) *	.154 (2.2) **	.055 (0.6)
Gradhs	.265 (3.1) ***	.275 (3.7) ***	.183 (2.2) **	.114 (1.7) *	.185 (2.5) ***	.155 (1.5) *
Avggrd	-.162 (-6.3) ***	-.170 (-5.8) ***	-.190 (-6.8) ***	-.266 (-11.7) ***	-.186 (-6.9) ***	-.259 (-7.7) ***
Math	-.125 (-8.1) ***	-.055 (2.9) ***	-.110 (-6.4) ***	-.059 (-4.1) ***	-.101 (-5.6) ***	-.095 (-1.4) *
Father	-.108 (-4.9) ***	-.141 (-5.9) ***	-.137 (-5.7) ***	-.122 (-6.3) ***	-.101 (-4.5) ***	-.117 (-4.3) ***

TABLE 4.18 (CONTINUED)

Navy Recruiting Areas

Variable	1	3	4	5	7	8
Albany	.163 (2.8) ***					
Boston	.316 (6.2) ***					
Buffalo	.229 (4.1) ***					
New York	-.089 (-1.6) *					
New Jersey	.031 (0.5)					
Montgomery		-.143 (-1.9) *				
Columbia		-.119 (-1.8) *				
Atlanta		-.149 (-2.5) ***				
Nashville		-.150 (-2.2) **				
Raleigh		-.101 (-1.7) **				
Richmond		-.237 (-3.1) ***				

TABLE 4.18 (CONTINUED)

	Navy Recruiting Areas					
	1	3	4	5	7	8
Variable						
Miami		.068 (0.9)				
Harrisburg			-.038 (0.6)			
Cleveland			-.121 (-2.0) **			
Columbus			-.106 (-1.9) **			
Pittsburgh			-.084 (-1.6) *			
Michigan			-.129 (-2.3) **			
Glenview				-.077 (-1.6) *		
St Louis				.102 (1.7) *		
Louisville				.134 (2.6) ***		
Kansas City				.011 (0.2)		
Minneapolis				.027 (0.5)		

TABLE 4.18 (CONTINUED)

	Navy Recruiting Areas					
	1	3	4	5	7	8
Variable						
Indianapolis				.117 (1.7) *		
Milwaukee				-.022 (-0.4)		
Denver					.070 (1.1)	
Albuquerque					.150 (2.5) ***	
Dallas					-.017 (-0.3)	
Houston					.172 (2.7) ***	
Little Rock					.022 (0.4)	
San Antonio					.146 (1.8) **	
Memphis					.157 (2.6) ***	
Los Angeles						.047 (0.7)
Portland						.129 (2.1) **

TABLE 4.18 (CONTINUED)

Variable	Navy Recruiting Areas					
	1	3	4	5	7	8
Seattle						.117 (1.1)
San Diego						.081 (2.0) *
N	14,472	10,910	12,068	18,348	12,948	9,843

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Source: Developed from data extracted from the Youth Attitude Tracking Study, 1976-1984.

Appendix D contains the contingency tables, comparing actual and predicted intention to join the military for individual recruiting areas. Again, approximately two-thirds of the cases are correctly classified.

The entire sample was finally run using SAS logit procedures. This provided sufficient time and disk space to include all the independent variables and the full sample of to be run.

Table 4.19 provides the logit regression coefficients. The independent variables (other than recruiting district) all have the same signs as in Tables 4.17 and 4.18. The

signs for the Navy recruiting districts did not necessarily remain the same as Table 4.18.

TABLE 4.19

LOGIT REGRESSION COEFFICIENTS
(Pooled Sample)

INTERCEPT	5.168	***			
AGE	-.282	***			
RACE	.681	***			
CURSCH	.246	***			
GRADHS	.342	***			
AVGGRD	-.352	***			
MATH	-.150	***			
FATHER	-.210	***			
ALBANY	.063		GLENVIEW	-.307	***
BOSTON	.319	***	ST LOUIS	-.001	
BUFFALO	.180	*	LOUISVILLE	.033	
NEW YORK	-.399	***	KANSAS CITY	-.175	
PHILADELPHIA	-.241	**	MINNEAPOLIS	-.121	
NEW JERSEY	-.178	*	OMAHA	-.161	*
MONTGOMERY	.190		INDIANAPOLIS	.016	
COLUMBIA	.258	**	MILWAUKEE	-.207	**
JACKSONVILLE	.422	***	DENVER	.063	
ATLANTA	.233	**	ALBUQUERQUE	.191	*
NASHVILLE	.175		DALLAS	-.064	
RALEIGH	.269	**	HOUSTON	.243	**
RICHMOND	.028		LITTLE ROCK	-.024	
MIAMI	.562	***	NEW ORLEANS	-.044	
HARRISBURG	.133		SAN ANTONIO	.190	
WASHINGTON DC	.170	*	MEMPHIS	.217	*
CLEVELAND	-.005		LOS ANGELES	-.168	
COLUMBUS	.024		PORTLAND	.019	
PITTSBURGH	.045		SAN FRANCISCO	-.248	
MICHIGAN	-.037		SEATTLE	.012	

N = 45,682

Base Case: Navy Recruiting District - San Diego

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Source: Developed from data extracted from the Youth Attitude Tracking Study, 1976-1984.

V. CONCLUSIONS AND RECOMMENDATIONS

This study has only opened the door for research on YATS intentions data as an indicator for predicting new contracts in Navy recruiting districts. The goal of this study was to investigate possibile alternative methods which might be used to forecast positive intention propensity to enlist in the Navy. Emphasis was placed on determing the positive intention propensity for recruiting areas and districts. The measure of intention is not intended to replace other statistical indicators currently used to estimate new contracts or recruiter goal allowcation.

A. CONCLUSIONS

1. YATS survey responses can be used to forecast the underlying local market propensity.

2. General military intention or intention to join the Navy could be used in the predicting model because military propensity and Navy propensity are so highly correlated.

3. There have been changes in propensity during the last three to four years of YATS; so it might be wise to restrict data analysis to relatively current data.

B. RECOMMENDATIONS

1. Analysis should be done using the YATS to predict Armed Services Vocational Aptitude Battery (ASVAB) testing rates and/or actual assessions by Navy recruiting districts.

2. The logit and probit models should be used to predit intention for 1985-1987 and then compared to actual intentions from the YATS to validate the intention prediction capability.

3. The YATS index should be added to the Navy recruiting goal allocation model selected to predict new contracts for past years to determine if the model with intention included is a better predictor of new contract, than the model currently used.

APPENDIX A

NAVY RECRUITING AREAS AND DISTRICTS

Area	District
Area 1 New England	Albany Boston Buffalo New York Philadelphia New Jersey
Area 3 Southeast	Montgomery Columbia Jacksonville Atlanta Nashville Raleigh Richmond Miami
Area 4 Northeast	Harrisburg Washington DC Cleveland Columbus Pittsburgh Michigan
Area 5 Midwest	Glenview St. Louis Louisville Kansas City Minneapolis Omaha Indianapolis Milwaukee
Area 7 Southwest	Denver Albuquerque Dallas Houston Little Rock New Orleans San Antonio Memphis

Area	District
Area 8 West	Los Angeles Portland San Francisco Seattle San Diego

APPENDIX B

NAVY RECRUITING DISTRICT SAMPLE SIZE

Area	Navy Recruiting District	Sample Size
New England	Albany	1937
	Boston	3347
	Buffalo	2208
	New York	2666
	Philadelphia	2753
	New Jersey	2080
Southeast	Montgomery	1081
	Columbia	1470
	Jacksonville	2041
	Atlanta	1664
	Nashville	1253
	Raleigh	1828
	Richmond	880
	Miami	1106
Northeast	Harrisburg	1609
	Washington DC	2939
	Cleveland	1558
	Columbus	2099
	Pittsburgh	2063
	Michigan	2211
Midwest	Glenview	3235
	St. Louis	1622
	Louisville	2554
	Kansas City	1617
	Minneapolis	2678
	Omaha	3374
	Indianapolis	1185
	Milwaukee	2596

Area	Navy Recruiting District	Sample Size
Southwest	Denver	1547
	Albuquerque	1775
	Dallas	1612
	Houston	1117
	Little Rock	1725
	New Orleans	3342
	San Antonio	916
	Memphis	1312
West	Los Angeles	1912
	Portland	2134
	San Francisco	2819
	Seattle	1940
	San Diego	1414
	Missing or Unidentified	794
	Total	82,013

APPENDIX C

CONTINGENCY TABLES, COMPARISON OF ACTUAL AND PREDICTED INTENTION TO JOIN THE MILITARY BY YEAR GROUP

1976-1978

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	59.8%	14.4%
	Will Join	17.9%	8.0%

N = 27,619
Proportion of the total correctly classified is 67.8%.

1979-1980

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	53.4%	23.2%
	Will Join	12.9%	10.4%

N = 25,150
Proportion of the total correctly classified is 63.8%.

1981-1984

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	63.2%	13.4%
	Will Join	17.0%	6.4%

N = 26,585
Proportion of the total correctly classified is 69.6%.

Source: Derived from data from the Youth Attitude Tracking Study, 1976-1984.

APPENDIX D

CONTINGENCY TABLES, COMPARISON OF ACTUAL AND PREDICTED INTENTION TO JOIN THE MILITARY BY AREA

AREA 1 (NEW ENGLAND)

		Predicted Intention: Will Not Join	Predicted Intention: Will Join
Observed Intention	Will Not Join	59.0%	18.1%
	Will Join	15.0%	7.9%

N = 14,472
Proportion of the total correctly classified is 66.9%

AREA 3 (SOUTHEAST)

		Predicted Intention: Will Not Join	Predicted Intention: Will Join
Observed Intention	Will Not Join	55.7%	13.7%
	Will Join	20.6%	10.0%

N = 10,910
Proportion of the total correctly classified is 65.7%

AREA 4 (NORTHEAST)

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	58.9%	17.0%
	Will Join	15.5%	8.6%

N = 12,068
Proportion of the total correctly classified is 67.5%.

AREA 5 (MIDWEST)

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	55.7%	13.7%
	Will Join	20.6%	10.0%

N = 10,910
Proportion of the total correctly classified is 65.7%.

AREA 7 (SOUTHWEST)

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	58.4%	14.9%
	Will Join	18.4%	8.4%

N = 12,948
Proportion of the total correctly classified is 66.8%.

AREA 8 (WEST)

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	61.3%	17.3%
	Will Join	15.0%	6.5%

N = 9,843
Proportion of the total correctly classified is 67.8%.

Source: Derived from data from the Youth Attitude Tracking Study, 1976-1984.

APPENDIX E

COMPARISON OF ACTUAL AND PREDICTED INTENTION TO JOIN THE MILITARY

		Predicted Intention	
		Will Not Join	Will Join
Observed Intention	Will Not Join	76.7%	01.4%
	Will Join	20.5%	01.4%

N = 45,682
Proportion of the total correctly classified is 78.1%

Source: Derived from data from the Youth Attitude Tracking Study, 1976-1984.

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