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RETENTION IN THE NAVY'S SELECTED RESERVE: AN ANALYSIS COMBINING SURVEY AND PERSONNEL DATA RECORDS

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RETENTION IN THE NAVY'S SELECTED RESERVE:
AN ANALYSIS COMBINING SURVEY AND PERSONNEL DATA RECORDS*

Executive Summary

In this paper, we relate stated intentions of enlisted Navy Selected Reservists to their future behavior. Using a set of questions from a national survey of Naval Reservists administered in the spring of 1980, we examine the relationship between their intentions to continue as drilling reservists and their subsequent behavior. In general, we find expectations are an important and significant determinant of continuation. However, the correlation with subsequent behavior is not sufficiently large to make intention data an appropriate tool for retention projections. Controlling for intentions, we find that dissatisfaction with training is related to reserve attrition. This finding suggests potential for policies to concurrently improve both the retention and readiness of the Naval Reserves. /

Personnel turnover has been a serious problem for the Naval Reserves. Programmed growth - an absolute increase of 25% by Fiscal 1988 - makes it especially worthwhile to focus attention on improving retention. By improving retention, the required number of accessions

* We want to thank Captain Milton Boykin, USNR, and Commander Hardy Merritt, USNR, for the use of their survey data. Additionally, we thank them and our colleagues at the Center for Naval Analyses for helpful comments.

will be reduced, administrative costs will be cut, and, in addition, morale will be positively influenced.

Background

Picture sailors in their traditional "cracker Jack" uniforms. The scene might well be an overseas port, aboard ship, or a precise formation on a parade grounds. There are no wide variations in height, weight, or age. No shades of difference in the color of the uniform. No dissimilarity in the cut or style of their attire. A sameness. A "One Navy."

In reality, however, the sailors are vastly different. Individual characteristics and background are never the same. Education and training may run many varied paths. Even the enlistment contract, commitment, and status as active duty or reserve differ. Some make a career of the Navy. Some spend the minimum time necessary. Some intend to remain or become a reservist. It is those differences of intentions to continue affiliating with the naval reserves which we hope to capture in this paper. For background, a brief outline of the reserve and active Navy is necessary.

The naval service is made up of men and women on active duty or in the reserves. Active duty is that 24 hour a day, yearly Navy employment. A reservist, on the other hand, may be a selected reservist

(SELRES) who attends military duty (drills) with his assigned unit one weekend per month, goes on active duty two weeks per year (ACDUTRA), and conceptually is a part time employee of the Navy.

To become affiliated with the Navy, Navy's Recruiting Command recruits non-prior-service accessions to fill the entry level (paygrades E-1 through E-3) requirements for both the active and reserve Navy. The active Navy accessions, obligated for 4, 5, or 6 years, are expected to advance in grade (paygrades E-4 through E-9) and, some, who leave active duty upon expiration of their active obligated service will voluntarily become members of SELRES.

To fill SELRES junior enlisted requirements, Navy's Recruiting Command recruits for two major enlistment programs: Ready Mariner* and Active Mariner. These programs involve a reduced active duty commitment and then, a mandatory SELRES obligation. Ready Mariners serve approximately six months active duty; Active Mariners serve for three years in the active force. Both programs trade off the shorter active duty time for a prolonged SELRES obligation; although the combined active and SELRES obligations for mandatory drillers total six years, the last year of the commitment can be spent in a non-drilling status. Upon completion of mandatory obligations, Ready Mariners and Active Mariners can continue to affiliate with the reserves as voluntary drillers.

* In FY 84 a new program, the Sea and Air Mariner Program (SAM) will replace the Ready Mariner program.

Both active and reserve communities, in short, have programs to attract entry level personnel, to groom these personnel for advanced or senior positions and, finally, to make continued association with the Navy attractive.

To fill requirements more senior than the entry level positions, the Navy reserve also recruits Navy veterans (NAVETS) into SELRES. Trained NAVETS, who completed their active duty obligation no more than 10 years previously, are attracted to the reserves by advertising, pay, reserve recruiters, patriotism, and their own particular civilian situation. Also, veterans of military services other than the Navy enter the Navy's SELRES; normally because of their experience they can enter at paygrades above the most junior levels.

With a knowledge of SELRES accession sources and an awareness that the Naval Reserves is facing retention problems, we turn to a discussion of the reservists' intentions to remain with SELRES, controlling for voluntary and mandatory drill participants.

The Data

The data for this analysis come from two sources: the 1980 National Survey of Reservists and the 1981 and 1982 Inactive Manpower and Personnel Management Information System (IMAPMIS) for Enlisted Selected Naval

Reservists. The survey data were collected by Captain Milton L. Boykin, USNR, and Commander Hardy Merritt, USNR, in the spring of 1980. They surveyed 3100 reservists (officers and enlisted) by mailing questionnaires to their drill units. The sample was generated by randomly drawing 1/28 of the 87,000 drilling reservists.*

The survey was comprised of 300 plus questions including basic demographic information, questions on the quality of the Reserve experience, reasons for initially affiliating with the Reserves, expectations about continued participation, and inquiries as to the reservist's views on the duties of citizenship. 1665 questionnaires with valid responses were returned, a 54 percent response rate.

Since our previous work had required building longitudinal data files for enlisted SELRES personnel, we had information on SELRES participation in the years 1977-82. We matched the 1665 survey respondents to the SELRES longitudinal file and found 1185 matches for our analysis of enlisted personnel. Sample sizes in the analysis are smaller than 1185 because not all questions on the questionnaire were completed by each reservist. Table 1 shows the breakdown of survey respondents by

* The Naval Reserve Personnel Center drew the sample. After scrambling the last four digits of the social security numbers, the IMAPMIS file was resorted by the redefined social security numbers. Then, every 28th name (beginning with the 14th on the list) was selected for the sample. A fuller description of the data can be found in M.L. Boykin, H.L. Merritt, and R.L. Smith, An Empirical Analysis of Retention within the United States Naval Reserve, Office of the Chief of Naval Reserves, New Orleans, 1980.

TABLE 1
ENLISTED SELRES RETENTION BY YEARS DRILLING

	Years drilling in 1980		Percent observed drilling in 1981		Percent observed drilling in 1981 and 1982	
	Mandatory	Voluntary	Mandatory driller, 1980	Voluntary driller, 1980	Mandatory driller, 1980	Voluntary driller, 1980
Less than 1	68	136	54.4%	63.5%	19.1%	47.8%
1-3	85	219	44.7%	65.3%	32.9%	53.4%
4-6	18	142	38.7%	78.2%	33.3%	71.1%
7-10	--	158	--	81.6%	--	74.7%
Greater than 10	--	314	--	84.4%	--	74.8%
Sample size	171	969				

length of service with SELRES, mandatory and voluntary drilling status, and survival in 1981 or in both 1981 and 1982.

There is probably some selection bias in that only 54 percent of the questionnaires were returned. In general, one might suppose individuals who were more interested in the Naval Reserves would have been more likely to complete and return the questionnaire. Overall continuation rates in our sample, however, do not differ greatly from those retention statistics we estimated from the total IMAPMIS enlisted file. For example, 73.1% of enlisted personnel in SELRES in 1980 were there in 1981; for our sample, the comparable figure is 74.3%. Thus, at least in their retention behavior, the sample appears representative.

Retention Intentions

The survey included six questions on intentions which are listed below. All questions except the second are scored on a one to five scale.

1. Do you intend to reenlist in the Naval Reserve when your enlistment expires? (Definitely will to definitely will not.)

2. If you had to make that decision at this time, what would you do? (Would or would not.)

3. How frequently do you think about trying to get out of the Naval Reserve? (Never to constantly.)

4. If you had to rate your chances of staying in the Naval Reserve on a scale from zero percent (0%) to ninety-nine percent (99%), what would you say are the chances you would remain in a drilling unit for another year? (Less than 20% to 80% - 100%.)

5. Using the same scale, what are the chances of your staying in for another three years?

6. Using the same scale, what are the chances of you staying in for at least twenty years?

The answers to questions 4 and 5 were most highly correlated with observed behavior in the 1981-82 period.* Tables 2 and 3 show the relationship among the survey responses and subsequent behavior for voluntary drillers and mandatory drillers, respectively. (Mandatory drillers are those individuals who identified themselves as such in the survey; these individuals entered SELRES under either the Active Mariner or the Ready Mariner program and, at least at the time of the 1980 survey, still had mandatory obligations to drill.)

As shown in table 2, about 1/5 (21.6 percent) of the voluntary drillers (primarily veterans of the Active Navy) in the survey left SELRES in the next year. Almost 1/3 (21.6 percent + 12.8 percent) of these individuals were not in SELRES both of the following two years. Over 70 percent (58.1 percent + 14.0 percent) of voluntary drillers rated their probability of remaining in SELRES for at least three years at 60 percent or higher. This is not that different from the percent who did participate for two years (65.6 percent), but, of course, they are not all the same people.

* The correlation coefficient between intention to stay at least one more year (intention to stay at least three more years) and SELRES participation in both 1981 and 1982 is .33 (.37). The comparable coefficients for SELRES participation in 1981, but not in 1982 are both .37.

TABLE 2

ENLISTED SELRES VOLUNTARY DRILLERS:
THE RELATIONSHIP BETWEEN INTENTIONS IN 1980
AND BEHAVIOR IN 1981 AND 1982

<u>Intent</u>		<u>SELRES Behavior</u>			<u>Row numbers and percent distribution</u>
<u>Being in SELRES in three years</u>		<u>Not in SELRES in 1981 or 1982</u>	<u>In SELRES in 1981 or 1982</u>	<u>In SELRES both years</u>	
Less than 20%	1	47 46.1%	19 18.6%	36 35.3%	102 10.5%
20%-39%	2	19 32.8%	11 19.0%	28 48.3%	58 6.0%
40%-59%	3	34 30.9%	16 14.5%	60 54.5%	110 11.4%
60%-79%	4	26 19.3%	16 11.9%	93 68.9%	135 14.0%
80%-100%	5	83 14.8%	62 11.0%	417 74.2%	562 58.1%
Column Numbers and p. cent distribution		209 21.6%	124 12.8%	634 65.6%	967 100.0%

Chi Square = 80.21

The prediction error is larger in the overall sample in terms of probabilities of leaving. Only 10 percent of the sample thought their probability of remaining in SELRES for at least three years was less than 20 percent, but after only two years more than double that number (21.6 percent) were not reported as SELRES affiliates.

For mandatory drillers, table 3, the fraction who stay in SELRES both years is much smaller, slightly under one-third (31.1 percent). This is not surprising, since the mandatory commitment for the majority of these individuals would have expired during 1981 or 1982.

Individuals who still had mandatory drilling requirements at the time of the survey do appear better able, overall, to accurately predict their probability of leaving the Reserves than do the voluntary drillers. Almost half (48.9 percent) of the individuals in table 3 indicated that their probability of remaining at least three years was extremely low and, indeed, almost half (48.9 percent) of them were gone by the next two years.

Retention Analysis

Here we will estimate in a multivariate framework, the actual retention behavior, investigating the effects of intentions, time in reserves, and satisfaction with particular aspects of the reserve experience. (Presumably general satisfaction with SELRES is reflected in the intention variable.)

TABLE 3

**ENLISTED SELRES MANDATORY DRILLERS:
THE RELATIONSHIP BETWEEN INTENTIONS IN 1980 AND
BEHAVIOR IN 1981 AND 1982**

<u>Intent</u>	<u>Subsequent Behavior</u>			<u>Row numbers and percent distribution</u>	
<u>Being in SELRES in three years</u>	<u>Not in SELRES in 1981 or 1982</u>	<u>In SELRES in 1981 or 1982</u>	<u>In SELRES both years</u>		
Less than 20%	1	57 64.8%	22 25.0%	9 10.2%	88 48.9%
20%-39%	2	10 52.6%	3 15.8%	6 31.6%	19 10.6%
40%-59%	3	11 55.0%	2 10.0%	7 35.0%	20 11.1%
60%-79%	4	4 28.6%	2 14.3%	8 57.1%	14 7.8%
80%-100%	5	6 15.4%	7 17.9%	26 66.7%	39 21.7%
Column numbers and percent distribution		88 48.9%	36 20.0%	56 31.1%	180 100.0%

Chi square = 48.80

The variables we will use in the statistical analysis are explained in table 4. Table 5 presents the estimated coefficients of the model obtained by a nonlinear estimation technique, in this case a probit equation.* Equations estimating continuation probabilities for the following year, 1981, as well as those for the next two years, 1981 and 1982, are reported.

As discussed earlier, intention questions phrased in terms of the probability of remaining in the Reserves had the greatest explanatory power for actual retention behavior. Both questions asking about the probability of remaining (for at least an additional year or for at least three more years) are statistically significant at the 95% level. Years in the Reserves adds explanatory power in both specifications: holding intentions constant, individuals who have drilled longer in SELRES are more likely to remain and continue to drill. Individuals who had been in SELRES less than one year at the time of the survey are somewhat less likely to remain; this result, however, is not statistically significant. Individuals who had a mandatory commitment at the time of the survey are more likely to leave in subsequent years, this result is only statistically significant, however, in the equation for two year retention. As has been noted earlier, by 1982 many of the mandatory obligations would have been over.

* Since the dependent variable is dichotomous (0,1), estimation by ordinary least squares is inappropriate. We want to estimate a curve whose values are bounded by zero and one. The probit specification generates such an S-shaped curve. In table 5 we present the slope of that S-shaped curve at the mean of the data (see column entitled derivative of conditional mean function).

TABLE 4
DESCRIPTION OF VARIABLES

YR8182:	Coded one if individual remains in Reserves in 1981 and 1982. Else zero.
YR81:	Coded one if individual remains in Reserves in 1981. Else zero.
Probl:	Probability that the individual will remain in the Naval Reserve for at least another year. Rated on a scale of one to five (one is less than 20%, five is greater than 80%, etc.).
Prob2:	Probability that the individual will remain in the Naval Reserve for at least another 3 years. Rated on the same scale as Probl.
Yrs:	Number of years the individual has been in the Naval Reserve. Coded one (less than one year), two (one to three years), three (four to six years), four (seven to ten years), and five (more than ten years).
Newres:	Coded one for individuals who have been in the Reserves for less than one year; otherwise, zero.
Mandatory:	Coded one for individuals who were mandatory drillers at the time of the survey; otherwise, zero.
Unit:	Degree of satisfaction with the unit affiliated with. (Coded from 5 (completely satisfied) to 1 (completely dissatisfied).
ACDUTRA:	Degree of general satisfaction with ACDUTRA experience relative to degree of overall satisfaction with the Reserve experience. Specifically, it is the one to five satisfaction scale variable "how do you feel about your experiences generally on ACDUTRA" divided by the one to five satisfaction variable "how do you feel in general about all your inactive duty reserve experience?"
Dependent Variable:	One if the individual participated in SELRES in the appropriate time period, otherwise zero.

TABLE 5
EQUATION ESTIMATES FOR SELRES CONTINUATION

	YR8182		YR81	
	Probit Coefficients	Derivative of Conditional Mean Function	Probit Coefficients	Derivative of Conditional Mean Function
Prob 1	.112 (2.14)	.043 (2.14)	.164 (2.95)	.054 (2.95)
Prob 2	.205 (4.48)	.079 (4.48)	.177 (3.55)	.058 (3.55)
Yrs	.137 (3.39)	.053 (3.39)	.170 (3.82)	.056 (3.82)
Newres	-.204 (-1.16)	-.079 (-1.16)	.097 (.51)	.032 (.51)
Mandatory	-.277 (-2.07)	-.107 (-2.07)	-.153 (-1.06)	-.050 (-1.06)
Unit	.012 (.28)	.005 (.28)	-.0006 (-.01)	-.0002 (-.01)
ACDUTRA	.160 (1.49)	.062 (1.49)	.105 (1.06)	.050 (1.06)
Constant	-1.121 (-4.26)	-.432 (-4.26)	-1.133 (-3.98)	-.372 (-3.98)
N. of obs.	941	941	941	941
Mean dependent	.64	.64	.74	.74
Chi square	168.7	168.7	159.2	159.2

Note: Asymptotic t values are in parentheses. Ordinary least square regressions (not reported) produce coefficient estimates similar to those in the conditional mean function. (Since the probit estimates are nonlinear, we present the slope of the equation at the mean.) The R^2 for the OLS equations were both .17.

The overall level of satisfaction with the Reserves is too closely related to intentions to permit the inclusion of general satisfaction measures and continuation expectations as separate independent variables. We do include, however, two particular measures of satisfaction in the equations. The first measures satisfaction with the unit with which the individual is currently affiliated. This variable is never statistically significant. The second measure of satisfaction is more interesting both because it is statistically significant and because it measures a feature of the Reserve experience that is more manipulable by policy.

The ACDUTRA variable is the individual's satisfaction with ACDUTRA relative to his overall satisfaction with the reserve experience. We find that individuals who are more satisfied with their ACDUTRA experience, relative to their overall satisfaction with the Reserves, are more likely to remain in the Reserves. In interpreting this variable it should be remembered that we are holding constant intentions to leave, years of drill experience, etc. (When we do not normalize the ACDUTRA satisfaction variable by the overall satisfaction level, the results are even stronger; in this case, however, we are probably attributing some general dissatisfaction to dissatisfaction with the ACDUTRA experience itself.)

We interpret the results as suggesting that improvements in the ACDUTRA experience aids Reserve retention and readiness. Readiness is

the ability of the unit to successfully complete its mission. Retention is directly related to readiness in that retaining trained, motivated personnel eliminates time and resources required to attain high states of readiness. Moreover, to achieve the required training, appropriate equipment is necessary.

More dollars for equipment and for training can potentially buy both increased retention and increased readiness. For many years ACDUTRA funds have been subject to considerable uncertainties; even being suspended for periods of time. This cannot help but have a demoralizing effect on the reservists who we especially want to retain: those individuals most interested in belonging to an effective and productive drilling unit.

Concluding Comments

By linking two data sets—one a survey of enlisted reservists, the other an official personnel file—we have been able to map intentions to subsequent SELRES participation. We found self-reported probabilities to be statistically significant predictors of actual continuation. Their explanatory power does not appear large enough to us, however, to be useful for prediction purposes.

Controlling for intentions and reserve experience, we found that reservists who were more dissatisfied with their experience on ACDUTRA than they were with their general Reserve experience, were more likely

to leave the Reserves. This finding is especially intriguing as it suggests that improving the ACDUTRA experience may improve retention as well as readiness. Clearly more research is needed on the retention effects of policies that would improve readiness. Training, equipment, and ACDUTRA are all candidates for such research.

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