Attrition of Navy Recruits From Initial Skills Training

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with
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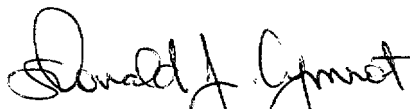
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Center for Naval Analyses

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The Navy expects to enlist about 55,000 sailors each year in the near future, and faces the challenge of training and delivering these recruits to operational billets. Accordingly, policy-makers wish to monitor the fraction of recruits who complete training, as well as the time it takes them to reach the fleet.

In this report, we track sailors "from street to fleet," analyzing factors that influence attrition from the Navy during the period of initial skills training. A companion report describes street-to-fleet trends and focuses on the time it takes recruits to reach the fleet [1].

The Director, Assessment Division (N81) requested this study as part of the Navy's Manpower and Personnel Integrated Warfare Architecture (IWAR). The IWAR is a planning vehicle that uses analyses to shape long-range goals and policies.

Issues

- Navy losses from bootcamp and schoolhouse
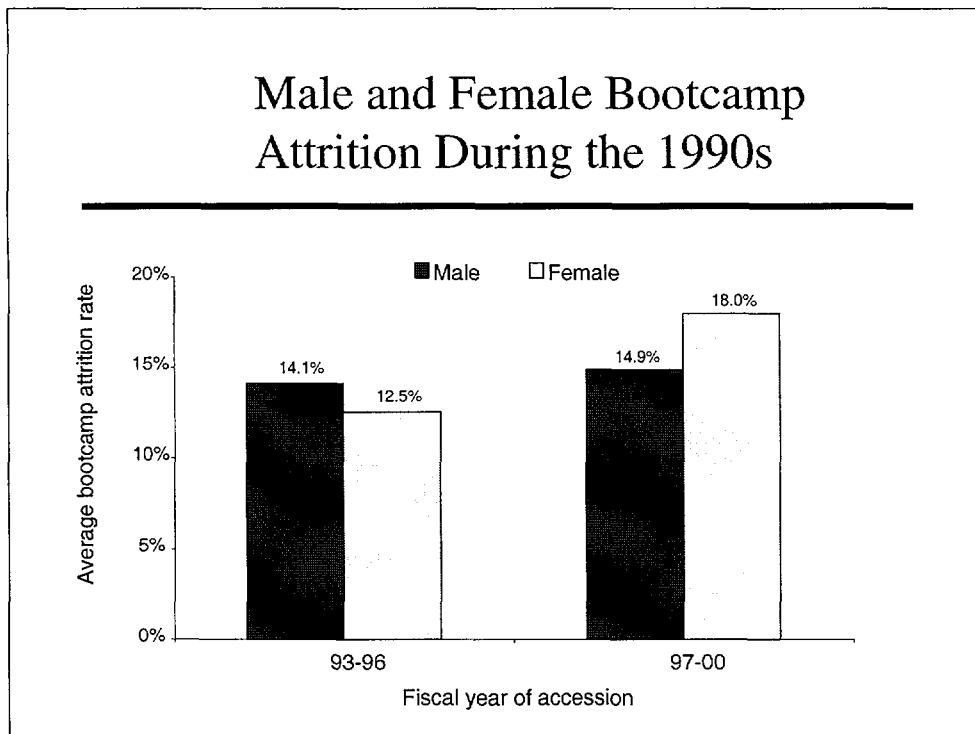- Roles of
  - Gender
  - Training time
  - Rating

This study examines prefleet attrition from the Navy. We do not investigate losses from the fleet, attrition from specific courses, or transitions between training programs.

N81 asked CNA to conduct regression analysis of three issues:

- **Gender.** Do men and women attrite at different rates? During the 1990s, bootcamp attrition increased for both sexes. But the change was especially dramatic for women. In a reversal of the previous pattern, female bootcamp attrition now exceeds that of males. Why?

- **Training pipeline.** Does the length or composition of the training pipeline affect attrition from the Navy? The 1990s saw increases in the average time it took recruits to reach the fleet and in amount of training time spent not under instruction (NUI).[1] Prefleet attrition increased at the same time [1, 2]. Is there a relationship? Training reengineering appears to have reduced the time it takes recruits to reach the fleet [1]. Can the Navy expect a positive impact on attrition?

- **Rating.** Are recruits in certain ratings—or training pipelines—more likely to attrite before reaching the fleet? Recruits are matched to ratings based on their intellectual credentials, so differences are to be expected. Beyond that, the difficulty of the curriculum, management of the A-schools, and other pipeline-specific factors may also affect attrition. If attrition from a certain pipeline is ultimately judged to be too high (or too low), reengineering may be appropriate.

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1. Includes time spent awaiting training, awaiting transfer, and in an interrupted instruction status.

The next section of the presentation describes patterns in attrition as they relate to gender, rating, and training time. We will then discuss other factors that may affect attrition.

This chart illustrates the difference in male and female bootcamp attrition for the "low attrition period" of FY93-FY96 and the later "high attrition period." Early separations from bootcamp peaked at 18.3 percent for the FY99 cohort, having increased from a low of 11.8 percent in FY96 [1].

Between FY97 and FY99, bootcamp attrition increased for both sexes, but the change for women was dramatic. Female attrition shot up from 13.8 percent in FY97 to 20.8 percent in FY98 (see backup slide). Women who entered bootcamp before FY98 attrited at about the same rates as their male peers.

It is tempting to ascribe the surge in female attrition to the onset of gender integrated bootcamp in the mid-1990s. However, gender integration predates the trend (see backup slide). More recent, but less well-known, policy changes may be affecting female attrition at bootcamp.

Another explanation is that the quality mix of male and female recruits changed during the period. We will explore this possibility later.

Post-bootcamp attrition increased for both sexes, as well. However, female attrition rates from A-school were slightly lower than male rates.

Attrition Has Increased With Time to Fleet

■ Prefleet attrition　━◆━ Time to fleet (non-attrites only)

Attrition rate (left axis: 0, 5, 10, 15, 20, 25, 30)

Average months to fleet (right axis: 0, 2, 4, 6, 8, 10, 12, 14)

Fiscal year of accession: 93, 94, 95, 96, 97, 98
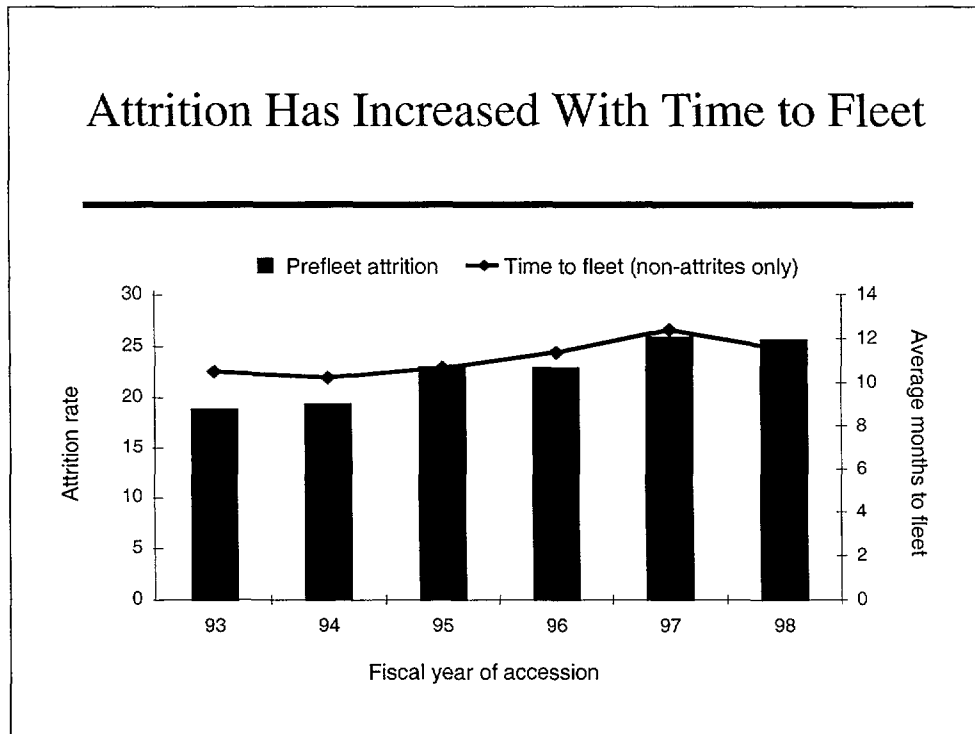
During the past decade, attrition has moved in the same direction as average time to the fleet. Here, time to the fleet is taken to represent all aspects of the training pipeline, including time under instruction, time not under instruction, time spent traveling to and from training centers, and the like. The averages include only those from a given cohort who actually reached the fleet.

There are several reasons to suspect that the two variables bear more than a temporal relationship. The first is mechanical. Suppose each recruit has a probability of attriting (say, for medical reasons) after t months in the Navy. If the t falls during the training period, any losses would be recorded as training attrition. If t falls after the training period, they would appear as fleet attrition instead. In other words, an increase in the time it takes the Navy to train recruits expands the opportunity for attrition to occur during training.

There are also behavioral reasons to suspect that attrition may be related to time to the fleet. Recruits may react to lengthening pipelines with frustration and impatience, especially if the extra time is spent awaiting instruction, awaiting transfer, or in an interrupted instruction status.

An alternative explanation is that both time to the fleet and attrition shifted in response to a separate set of influences. It is possible, for instance, that changes in recruit quality were responsible for both trends.

4

Attrition by Rating Group

□ Attrited from Navy at bootcamp   ▣ Attrited from Navy at schoolhouse
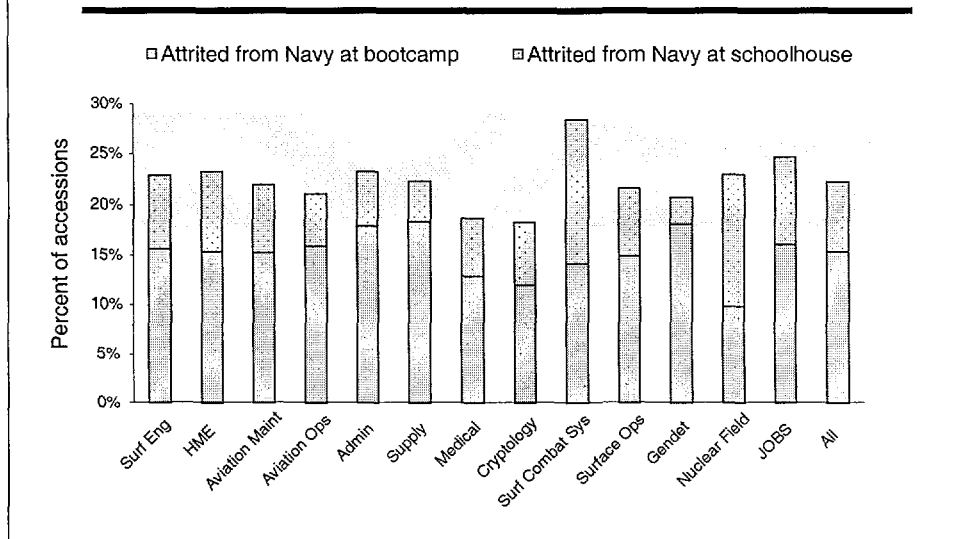
Attrition varies by rating group. The differences may be explained by characteristics of the training pipelines themselves (e.g., difficulty of courses), the quality of recruits assigned to each rating, or both.

Here, we chart the attrition from the Navy of recruits who entered in FY97 and FY98, categorized by the rating they were promised.[1] The data are broken down by rating, and split between attrition from bootcamp and attrition from the schoolhouse.[2] Both types of attrition are calculated as percentages of accessions.

Medical- and cryptology-promised recruits have the greatest chance of reaching the fleet. Accessions who were promised training in surface combat systems (e.g., FC) had the smallest chance of reaching the fleet (72 percent). Other high-attrition ratings groups include admin, nuclear field, and hull/mechanical/electrical skills (HME). Recruits who entered under the Job-Oriented Basic Skills (JOBS) program were also likely to attrite.

1.We did not account for recruits who switched training programs between the time of entry and arrival to the fleet.

2. Throughout the paper, we use the terms "schoolhouse attrition" or "post-bootcamp attrition" to refer to separations from the Navy that occur between graduation from bootcamp and the date of arrival to the fleet.

Approach

- Regression
  - Control for confounding factors
- Use Street-to-Fleet database
- Bootcamp attrition: accessions FY93-FY00
- Schoolhouse attrition: accessions FY93-FY98 who entered A-school

We use logistic regression to assess the roles of gender, rating, and training time while adjusting for the impact of confounding factors, such as recruit quality. Logistic regression (or logit) is appropriate for modeling binary outcomes—in this case, either complete training or attrite.

As in [1] and [2], we employ CNA's Street-to-Fleet (STF) database. This database merges accession, personnel, and training records to follow each recruit from bootcamp, through initial schooling, and into the fleet. Details about STF appear in backup and are discussed in [3] and [4].

We model attrition during two phases of training: (1) bootcamp, and (2) after bootcamp and before reaching the fleet. The latter category, which we call schoolhouse attrition, encompasses both A-school and C-school; we make no distinction between the two. In keeping with the IWAR team's interest in initial skills training, we do not analyze attrition from the fleet.

The analysis of bootcamp attrition includes recruits who entered bootcamp between FY93 and FY00. The analysis of schoolhouse attrition includes students who entered the Navy between FY93 and FY98. As shown in a backup slide, much of the FY99 and FY00 cohorts had yet to achieve one of the two outcomes by the end of the data period.

Other Determinants of Attrition

- AFQT
- High school degree status
- Months in Delayed Entry Program
- Waivers
- Age at entry
- Marital status at entry
- Contract length
- Lifestyle
- Expectations, attitudes, other unobservables

To understand the roles of gender, rating, and training time in attrition, we must adjust for recruit quality and other influences. Studies have repeatedly shown most of the following to be effective predictors of attrition. Other variables on the list have figured less prominently in previous studies but are worth investigating.

Armed Forces Qualification Test (AFQT) score. All else equal, recruits who score in the upper 50th percentile of the AFQT have a small but reliable edge over those in the bottom half [5], and they are less likely to attrite from A-school [6].

High school degree (HSDG) status. Possession of a high school degree is probably the single most important indicator that a recruit will complete the first term of enlistment [7].

Months in the Delayed Entry Program (DEP). DEP accessions attrite at lower rates because they have more time to reconsider their decision to join the military. Furthermore, added DEP time reduces attrition--accessions who spent 6 months there have 45-month attrition rates about 10 points lower than those who spent only 1 month [8].

Waivers. About 30 percent of Navy recruits enter the service with some sort of enlistment waiver, such as for drug use, prior arrests or convictions, dependents, or medical problems. Among the waivered group, the highest attrition is found among those with previous disqualification or separation waivers [3], but this

group is very small. A study of recruits from California found that 4YOs who had been arrested before joining the Navy had a first-term attrition rate 10 percentage points greater than that of recruits who had never been arrested [9].

Race and ethnicity. African-Americans are more likely to complete their contracts (remain in the Navy 45 months) than are non-African-American recruits. Hispanics have lower attrition rates than non-Hispanics [7].

Age at entry. Some studies have found that younger recruits are less likely to leave the Navy before the end of their obligations [7].

Marital status at entry. The expected correlation between marital status and attrition is ambiguous.

Contract length. All else equal, contract length may capture otherwise unobservable personal characteristics, such as willingness to commit to a job and taste for military life. For example, 6YOs may be more likely to complete training than 2YOs.

Lifestyle. Preservice smoking has been found to be a predictor of attrition in bootcamp [3]. Lifestyle variables are not present in our database. If smoking and drinking are correlated with other determinants of attrition (e.g., age, gender, or education), our findings for those variables reflect the impact of lifestyle, as well.

Other factors are difficult, if not impossible, to measure directly. The expectations and attitudes that recruits bring to their training, their civilian options, their suitability for the rating they have been promised, and quality of trainers may all play a role in attrition.

Analysis of Bootcamp Attrition

- Emphasis on gender
  - Promised rating—no direct relevance to bootcamp experience
  - Bootcamp training time—crude metrics, little variation
- Sample

The analysis of bootcamp attrition incorporates all variables of potential significance but the emphasis is on gender. The late 1990s change in bootcamp attrition is of interest. How much was due to a change in the quality of female (and male) recruits? How much reflects extrinsic factors, such as policy/leadership changes at Great Lakes?

The rating that a recruit is promised is unlikely to affect his or her experience of bootcamp. All recruits attend the same bootcamp. However, promised rating may have an impact on expectations about what lies ahead. It may reflect aspects of recruit quality that do not show up in the data, such as work experience or quality of high school curriculum. For this reason, we include promised rating in the regressions.

We experimented with bootcamp training time—average duration and percentage of time not under instruction.[1] However, the training time variables did not improve the predictive ability (fit) of the logistic regressions. This may be due to the crudeness of our metrics. For example, our data do not tell us when the attrition decision was made, and it is only possible to have eight training time values in the dataset (one for each year).

We used a random sample of 194,977 people who entered the Navy between FY93 and FY00, 50 percent of the recruit population during that period.

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1. To construct these variables, we computed the mean time (duration or percent NUI) of bootcamp graduates from each cohort. We assigned that value to all members of that cohort, including those who did not graduate from bootcamp.

Bootcamp Attrition: Main Results

- Education, waivers, DEP and rating important
- Women slightly more likely to attrite than men
  - Mostly due to late '90s data
- Lower recruit quality explains very little of surge in female attrition

A backup table gives detailed results. Our main results are as follows. We find education/AFQT, time in DEP, and waivers to be significant drivers of attrition. For example:

- The average attrition rate of B-cell recruits is 7.8 percentage points higher than that of otherwise identical A-cell recruits.[1]

- All else equal, a recruit with a previous disqualification waiver has an probability of attriting that is 4.7 percentage points greater than a recruit with no waiver.

- Each month in DEP reduces the probability of attrition by .4 percentage points.

- We also find that a model that includes a recruit's rating better fits the data than one that does not.[2] Perhaps rating captures aspects of a recruit's ability that are not reflected in education and AFQT.

Women are more likely to attrite than men who are identical in all other respects. This small but statistically significant result appears to be driven by later years of data. If we eliminate FY98-FY00 accessions from the sample, the result is reversed: women are *less* likely to attrite. This raises an interpretation issue. Should we place less weight on the more recent years, supposing that something unusual is going on? Or should we factor in the FY98-FY00 experience as we would any other year? Ultimately, the data suggest that female attrition is relatively sensitive to conditions that are not in our data.We also find that the recent surge in female attrition can't be explained by diminished quality of female recruits.

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1. A-cell: AFQT 50+, HSDG. B-cell: AFQT 50+, no HSDG. C-cell upper: AFQT 31-49, HSDG. C-cell lower: AFQT 24-30, HSDG; D-cell: AFQT<50, no HSDG.

2. The likelihood ratio statistic is 341.3, far above the critical value needed to reject the hypothesis of no ratings differences.
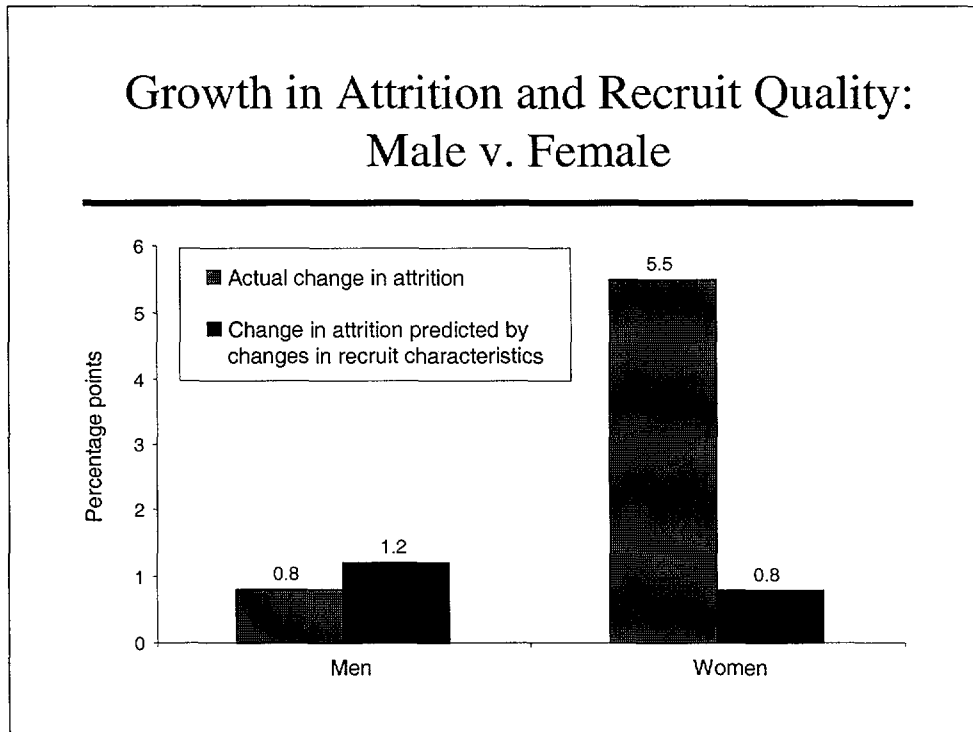
Changes in Characteristics of Recruits: Male v. Female

	Attrition impact of variable	FEMALE		MALE	
		FY93-FY96	FY97-FY00	FY93-FY96	FY97-FY00
A-cell	−	63.3%	60.7%	63.2%	57.8%
Waiver	+	20.7%	24.2%	29.7%	34.2%
Black	−	24.9%	27.2%	17.0%	18.7%
Hispanic	−	9.6%	11.7%	9.6%	11.2%
DEP months	−	3.9	4.2	4.7	3.8
Age	+	19.7	19.7	19.7	19.8
GENDET	+	43.8%	34.2%	4.2%	2.5%
Jobs	+	1.9%	2.0%	1.7%	2.0%

This chart shows that the quality of female recruits declined in certain respects. A-cells (AFQT 50+ and HSDG) made up 63 percent of women who entered between FY93 and FY96, but only 61 percent of those who entered in the past four years. The incidence of waivers increased as well.

If this were all that changed, we would expect a large increase in female bootcamp attrition. However, other changes in recruit characteristics tend to push attrition down. DEP time has increased, more female recruits are black or Hispanic, and far fewer are GENDETs.

Growth in Attrition and Recruit Quality: Male v. Female

The regression equation (in backup) can be used to calculate how much of the attrition change is attributable to changes in recruit characteristics, such as education, time in DEP, promised rating, fiscal year of accession, and age. As in the previous chart, we compare the FY93-FY96 cohorts with recruits who entered in later years.

Changes in the characteristics of men explain the male attrition trend well. In fact, quality alone predicts an attrition change that is slightly larger than actually occurred.

This is not the case for women. Less than 1 percentage point of the change in attrition can be attributed to changes in the characteristics of female recruits. In reality, female bootcamp attrition increased by 5.5 percentage points.

Thus, most of the increase in female attrition occurred within quality categories, suggesting the importance of other factors that do not appear in our model. Candidates include unmeasured recruit characteristics (such as motivation) and policies at Great Lakes.

Our finding is consistent with other work. Referring to the combined male-female trend, a recent study concluded that "observed changes in accession quality account for only a small portion of the sharp increase in bootcamp attrition" [10]. Changes in the quality-cell distribution between 1996 and 1999 would have caused bootcamp attrition to increase 1 percentage point, but, in fact, it increased by nearly 7 points.

Analysis of Schoolhouse Attrition

- Emphasis on
  - Promised rating
  - Training time
    - Total
    - Percentage of time not under instruction
- Sample
- Construction of training time variables

We now turn to our analysis of schoolhouse attrition. We emphasize rating and training time, but include gender in the analysis as well.

The sample consists of 77,724 recruits who entered the Navy between FY93 and FY98, who had completed bootcamp, and whose records show attendance at an A-school. Some had also received follow-on training. In our model, schoolhouse attrition occurs when someone graduates from bootcamp but does not reach full duty in the fleet. The sample excludes recruits who made it to the fleet as GENDETs and "good" attrites, such as those who became officers.

We take the rating the recruit was promised as an indicator of their A-school training experience in addition to a statement about their quality.

We experimented with several training time variables but settled on the following:

- Total time between accession and arrival to the fleet—includes bootcamp and schoolhouse training
- Percentage of that time spent not under instruction (NUI).

We computed average values for each of 6 fiscal years and approximately 120 ratings, resulting in about 720 values. The averages included only those recruits who:

- Reached full duty
- Continued in the same pipeline throughout—the rating they were promised was the rating they had when they reached the fleet.

We then matched the averages to the entire sample on the basis of each recruit's accession year and promised rating.

Schoolhouse Attrition: Main Results

- Similar to bootcamp results
  - Education quality, waivers, DEP important
  - Women more likely to attrite than men
- Attrition differs by rating
- Attrition increases with training time and percentage of time NUI
  - Small impact

The results are similar to those found for bootcamp: education cell, waivers, and time in DEP continue to be important predictors of attrition after bootcamp. Controlling for other characteristics, women are more likely than men to attrite from the Navy during A-school or C-school.

Rating is important as well. This may reflect differences in A-school or C-school curricula, schoolhouse management, or students' perceptions of career prospects in the rating.

We also found small, but significant relationships between attrition and training time. The model with average total days of training fits the data better than the model that includes percentage of training days not under instruction. Both fit better than the model that omits training time.[1]

The impact is small:

- Each 1-day increase in total time to the fleet increases attrition by .017 percentage points.
- Each 1-point increase in the percentage of time NUI increases attrition by .054 points.

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1. Likelihood ratio tests of Model 1, Model 2 and Model 3 (see backup). Each model uses a robust variance estimator, which adjusts for clustering around the training time variables.

Impact of Training Time: Simulations

	Average total days in training	Percent training days NUI
Baseline attrition rates (% of A-school students)	9.28	9.28
Baseline number of attrites	3,530	3,530
Change training time	+30 days	+4 points
Predicted change in attrition	.51 points	.22 points
Predicted attrition rate	9.79	9.50
Predicted number of attrites	3,720	3,610
Change in number of attrites	+190	+80

This table shows that the impact of training time is small. On an annual average basis, NUI days ranged from 16 to 22 percent of training time. Thus, an increase of 4 percentage points would be considered large, but it would increase attrition by only 80 people per year. Total training days averaged 277 for the FY93 cohort and 329 for the FY97 cohort, a range of 52 days. Increasing training time by 1 month would lead to about 190 extra attrites. In contrast, about 38,000 from each cohort enter A-school.

Conclusions

- Gender, rating and training time all correlated with prefleet attrition
- Still unanswered
  - Do longer training pipelines merely shift attrition that would have occurred in the fleet anyway?
  - What explains late-1990s increase in female attrition?

This study developed statistical models to predict attrition from bootcamp and from schoolhouses. It found that, all else equal, gender, rating, and training time all affect attrition. The study quantified these effects and explained the extent to which they could explain recent trends.

Several questions remain for future research. We found a correlation between prefleet attrition and training time, but did not attempt to isolate the cause of the relationship. Perhaps longer training pipelines merely shift attrition that would have occurred in the fleet to the prefleet period. On the other hand, longer training pipelines, or greater percentages of time not under instruction, may generate additional attrition. The latter case has more serious training policy implications than the former.

The recent increase in the attrition of women from bootcamp is another topic that deserves additional investigation. The trend is ongoing. Our analysis was able to determine that the change cannot be attributed to the observable characteristics of the female recruits, but we were not able to determine the cause.

Backup Information

Street-to-Fleet Database

- Tracks recruits from bootcamp and into the fleet
- Accession data from DMDC and CNRC
  - Cohorts FY90 through FY99
- Personnel data from the EMR file
  - Career events FY90 through March 2001
- Training data from NITRAS
  - Courses taken FY93 through April 2001

The accession data, which come from the Defense Management Data Center (DMDC) and Commander Naval Recruiting Command (CNRC), include the rating promised, program, and length of contract under which each recruit enlisted. The current version contains all non-prior-service accessions who entered the Navy from FY90 through FY00.

The personnel data, which come from BUPERS' Enlisted Master Record (EMR) file, include rate obtained, date of full-duty status, and, if applicable, date of and reason for separation. The current version of STF contains personnel data through March 2001.

The training data, which come from NITRAS, contain a historical record of the individual courses each recruit took. It contains the time each recruit spent under instruction, awaiting instruction, awaiting transfer, and in an interrupted instruction status. The current version contains data on courses that were completed between FY93 and the end April 2001.

Status of FY99 and FY00 Recruits as of March 2001
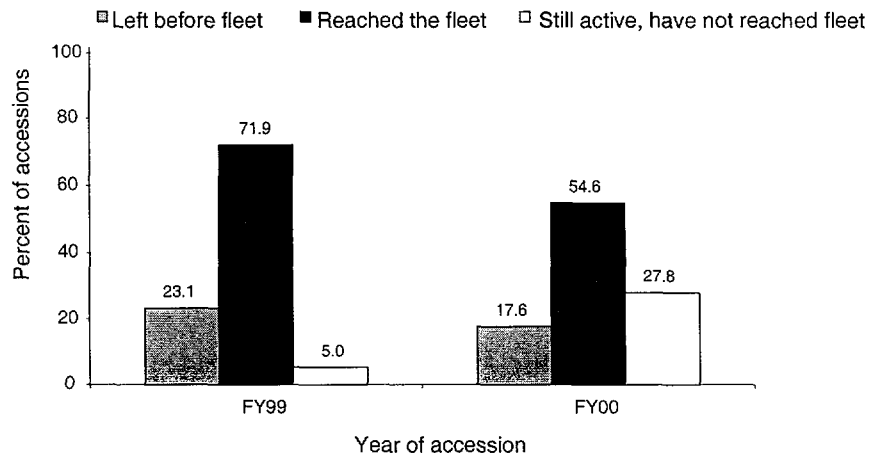
Our analysis of post-bootcamp attrition excludes the FY99 and FY00 cohorts because many of those recruits—most of them 6YOs—have neither left the Navy nor reached the fleet by March 2001, which is the last month of our data. In contrast, over 99 percent of the FY98 cohort has reached some final status, having either left the Navy or reached the fleet.

We include the FY99 and FY00 cohorts in our analysis of bootcamp attrition. No FY00 recruits were remaining in bootcamp by March 2001; 86 percent had graduated, while 16 percent had attrited.

Gender Integration and Attrition Trend: No Clear Relationship
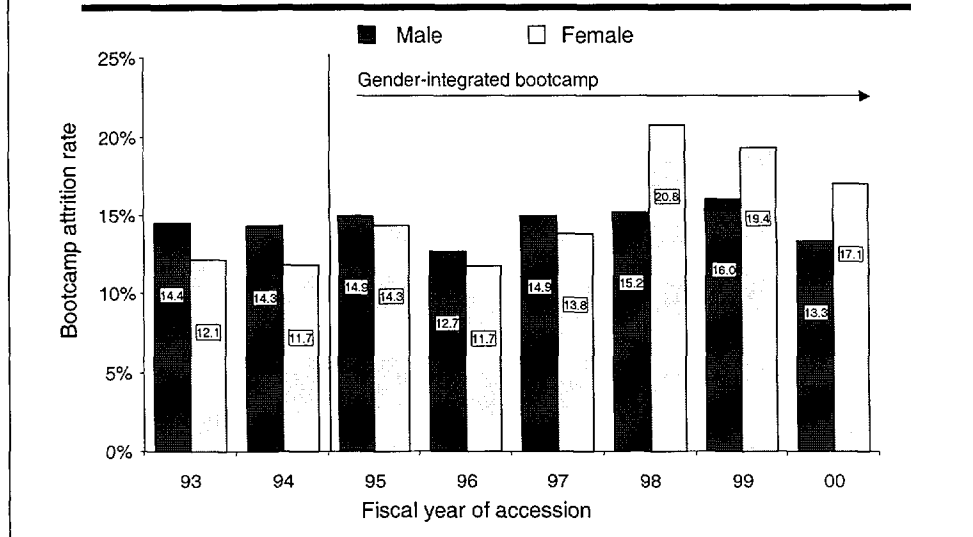
The Recruit Training Command at Great Lakes was gender-integrated by the summer of 1994. Therefore, all the recruits who entered FY95 or later were part of the gender-integrated program (however, due to the small numbers of women, not all men actually trained in gender-integrated divisions) [3].

Bootcamp Attrition Regression Results

Variable	Marginal effect (percentage points)
Female	0. 9*
Married at entry	1.1*
Age at entry (years)	0.3*
Race/ethnic (relative to White)	
African American	-3.1*
Hispanic	-5.0*
Native American/Alaskan	1.6*
Asian/Pacific Islander	-9.5*
Months in DEP	-0.4*
Waivers (relative to no waiver)	
Moral	3.1*
Dependents	2.5*
Physical	2.6*
Previous disqualification	4.7*
Other waivers	3.0*
Education quality (relative to A-cell)	
B-cell	7.8*
C-cell upper	3.3*
C-cell lower	-2.6
D-cell	7.3*
Contract length (relative to 2YO)	-2.6
3YO	-0.5
4YO	-0.5
5YO	0.2
6YO	-1.6*
Promised rating (relative to Surface Ops)	
Construction	0.3
Surface engineering	1.2*

(continued)

Bootcamp Attrition
Regression Results (continued)

Surface engineering	1.2*
Hull, mechanical, electrical	1.2*
Aviation maintenance	-0.1
Aviation operations	1.0*
Aviation supply	2.4*
Administration	0.9
Deck	2.0*
Supply	3.8*
Medical	-1.7*
Cryptology	-1.1*
Surface combat systems	-0.4
Submarine	0.5
Music	-13.2*
GENDET	2.9*
Nuclear field	-5.1*
JOBS	2.6*
Other	0.3
Bootcamp attrition rate—baseline	14.6
Number of observations	194,977
Log likelihood	-78850.7

*Statistically different from zero with 90% confidence.

Dummy variables for fiscal year not shown.

Marginal effect is the percentage point change in an individual's probability of attrition that results from a unit increase in the variable or, as appropriate, a change in its value from zero to one.

Post-Bootcamp Attrition
Regression Results

Variable	Marginal effect (percentage points)		
	Model 1	Model 2	Model 3
Avg total days in training	--	0.017*	--
Avg percentage of training days NUI	--	--	0.054*
Female	2.4*	2.4*	2.4*
Married at entry	-0.9	-0.9	-0.9
Age at entry (years)	-0.2*	-0.2*	-0.2*
Race/ethnic (relative to White)			
African American	-2.7*	-2.6*	-2.7*
Hispanic	-3.1*	-3.1*	-3.1*
Native American/Alaskan	0.4	0.4	0.4
Asian/Pacific Islander	-5.6*	-5.7*	-5.6*
Months in DEP	-0.4*	-0.4*	-0.4*
Waivers (relative to no waiver)			
Moral	2.6*	2.6*	2.6*
Dependents	1.8*	1.7*	1.8*
Physical	-0.1	-0.1	-0.1
Previous disqualification	1.1	1.1	1.1
Other waivers	1.9*	1.9*	1.9*
Education quality (relative to A-cell)			
B-cell	5.1*	5.2*	5.0*
C-cell upper	0.5	0.9*	0.5*
C-cell lower	10.0*	10.8*	9.8
D-cell	7.5*	8.0*	7.5*
Contract length (relative to 2YO)			
3YO	-2.9	-2.5	-2.8
4YO	-1.3	-0.6	-1.2
5YO	1.0	1.0	1.0
6YO	4.5*	2.4	4.7

(continued)

Post-Bootcamp Attrition
Regression Results (continued)

Promised rating (relative to Surface Ops)

Construction	-4.7*	-2.8*	-4.5
Surface engineering	1.5*	1.9*	1.0
Hull, mechanical, electrical	0.7	1.6*	0.5
Aviation maintenance	-1.2*	-1.1*	-1.5
Aviation operations	-3.8*	-2.1*	-3.9*
Aviation supply	-5.4*	-3.5*	-5.5*
Administration	-1.1	0.7	-1.3
Deck	-4.3*	-2.3*	-4.4*
Supply	-1.6*	0.2	-2.0*
Medical	-5.5*	-4.4*	-5.2*
Cryptology	-3.2*	-4.8*	-3.6*
Surface combat systems	2.8*	1.5*	2.7*
Submarine	1.9*	2.1*	1.9*
Music	-5.9*	-5.7	-5.9
GENDET	0.4	0.4	0.2
Nuclear field	0.5	-2.1*	0.6
JOBS	4.9*	3.2*	4.4*
Other	1.0*	-0.5	0.6
Post-bootcamp attrition rate--baseline	9.3	9.3	9.3
Number of observations	77,724	77,724	77,724
Log likelihood	-22816.9	-22725.7	-22810.7

*Statistically different from zero with 90% confidence.

Dummy variables for fiscal year not shown.

Marginal effect is the percentage point change in an individual's probability of attrition that results from a unit increase in the variable or, as appropriate, a change in its value from zero to one.

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