Assessing How Delayed Entry Program Physical Fitness is Related to In-Service Attrition, Injuries, and Physical Fitness

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Photography Credit: Marines demonstrate how to properly perform crunches for an Initial Strength Test for female poolees who are enrolled in the Delayed Entry Program. Westover Air Reserve Base, Chicopee, Massachusetts, Mar. 25, 2013. (U. S. Marine Corps photo by Sgt Richard Blumenstein/Released)

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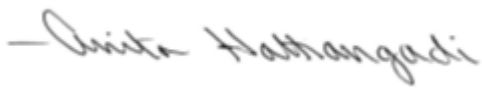

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Abstract

Over the past several years, the Department of Defense has asked the services to investigate their ability to expand opportunities for women in the military. In support of this initiative, the Marine Corps started a deliberate and measured effort to examine the possible integration of female Marines into ground combat units and Military Occupational Specialties (MOSs) with the development of the Marine Corps Force Integration Plan (MCFIP). In support of this effort, CNA was asked to examine the relationship between the Initial Strength Test (IST) given to recruits at the time of enlistment and early attrition, recruit training injury rates, scores on the Physical Fitness Test (PFT), and scores on the Combat Fitness Test (CFT); and how these relationships vary by gender. This paper presents the results of this examination. We found that the IST score is a good predictor of attrition, injury rates, and PFT and CFT scores, with a higher IST score leading both to lower attrition and injury rates and to higher PFT and CFT scores. We also found, however, that a significant share of men and women who score well on the IST end up scoring poorly on the PFT and CFT; conversely, a significant share who score poorly on the IST, score well on the PFT and CFT. This latter finding suggests that any classification policies for physically-demanding MOSs that are based on IST scores should include provisions to reconsider the MOS classification if recruit training PFT and CFT scores differ significantly from the IST score.

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Executive Summary

The recent lifting of Department of Defense (DOD) combat exclusion provisions has prompted the Marine Corps to consider administering physical fitness tests before Marines are classified into physically demanding Military Occupational Specialties (MOSs). Since this classification process starts in the Delayed Entry Program (DEP), the Marine Corps needs to know whether the Initial Strength Test (IST) administered in the DEP can be used to classify recruits into Programs Enlisted For (PEFs) that contain physically demanding MOSs. Central to answering this question is whether IST scores are reliable predictors of attrition, injuries during recruit training, and in-service physical fitness. To assist the Marine Corps with early classification of recruits into physically demanding MOSs, this paper explores the relationships between DEP IST scores and attrition, injuries during recruit training, and in-service physical fitness.

Since the Marine Corps is considering using the IST as a criterion for PEF assignment, we selected the first IST score recorded in the DEP, since the timing would generally coincide with assignment of a recruit's PEF. Recruiters try to assign PEFs to recruits as early as possible once they are in the DEP, so we chose the first IST recorded in the DEP to facilitate our analysis. For the DEP IST score, we combined the three separate IST events—the 1.5-mile run, pull-ups/flexed-arm hang (FAH), and crunches—to create a composite score that, as we explain later in this report, closely mirrors the scoring procedure for the Physical Fitness Test (PFT). We then measured the relationship between this composite DEP IST score and attrition rates, injury rates while in recruit training, and various PFT and Combat Fitness Test (CFT) scores taken during a Marine's initial enlistment.

DEP IST score and attrition rates

Table 1 summarizes the relationship that we found between the DEP IST score and attrition during three key time periods in an enlisted Marine's career:

- during recruit training,
- before the completion of 24 months of service, given that the Marine successfully completes recruit training, and

- before 45 months of service, given that the Marine successfully completes 24 months of service.

From Table 1, we see that, although the average attrition rate for men during recruit training is 7.6 percent, the predicted recruit training attrition rate for men who score in the top third of all male recruits on the IST is only 5.0 percent. This rate rises to 7.1 percent for men who score in the middle third of the IST, and to 10.2 percent for men who score in the bottom third of the IST. For women, the relationships are similar: higher scores on the DEP IST predict lower attrition rates during recruit training for women.

Table 1. Predicted[a] recruit training attrition rates, conditional 24-month attrition rates, and conditional 45-month attrition rates by DEP IST categories and gender

	Men			Women		
	Recruit training attrition	Attrition before 24 months of service, conditional on completing recruit training	Attrition before 45 months of service, conditional on completing 24 months of service	Recruit Training Attrition	Attrition before 24 months of service, conditional on completing recruit training	Attrition before 45 months of service, conditional on completing 24 months of service
IST top third	5.0%	6.1%	5.8%	10.1%	7.4%	7.2%
IST middle third	7.1%	6.8%	6.6%	14.1%	8.7%	7.6%
IST bottom third	10.2%	7.1%	7.8%	19.6%	9.8%	8.0%
Average attrition (actual)	7.6%	6.7%	6.8%	14.7%	8.7%	7.6%
Number of observations[b]	257,385	190,026	134,880	21,910	14,530	9,676

Data source: CNA Marine Corps personnel files

[a] The predictions are based on coefficient estimates in a logit regression. These coefficient estimates are given in Table 14, Table 17, and Table 18 in the appendix.

b. The number of observations progressively drops from recruit training to 24-month to 45-month attrition. This is because some recruits who could be counted for recruit training attrition cannot be counted for 24- and 45-month attrition because they will not have been on active duty long enough to have reached these benchmarks.

The 24- and 45-month conditional attrition rates show whether the effect of the IST score on attrition is persistent throughout the course of a Marine's initial enlistment or whether that effect declines over time. For both men and women, higher IST scores are associated with decreased attrition over the course of a Marine's first enlistment, but the relative effect of these higher IST scores on attrition rates generally declines throughout the first enlistment.

DEP IST score and injury rates

We were unable to obtain injury data, so we proxy recruit training injuries as follows: injured recruits are defined as those who were discharged for medical reasons or those who were medically recycled during recruit training.[1] To compare men and women, we analyze only recruits trained at Parris Island, since women are only trained at Parris Island.

We find that injury rates during recruit training are lower for both men and women who have higher DEP IST scores. Although the average injury rate for men in recruit training is 3.6 percent, men in the top third of the IST score have only a 2.5 percent predicted injury rate, men in the middle third have a 3.7 percent predicted injury rate, and men in the bottom third have a 4.7 percent predicted injury rate in recruit training. The average female injury rate is 6.0 percent, and the corresponding percentages follow a similar pattern: 4.7, 5.9, and 7.7. Thus, we conclude that higher DEP IST scores predict lower injury rates in recruit training for both men and women.

DEP IST score and PFT and CFT scores

To measure the relationship between the DEP IST score and various PFT scores taken during a Marine's first enlistment, we classify men and women separately into one of the following categories:

- IST 300 (perfect score),
- IST top third (but not 300),
- IST middle third, and
- IST bottom third.

From Table 2, we see that although the average score for the PFT taken at the end of recruit training for men is 244, the predicted PFT score for men scoring 300 on the DEP IST is 291, the predicted PFT score for men scoring in the top third (but not 300)

[1] The expected timeline to receive actual injury data was too long for this quick-response study. We consider the injury indicator that we constructed a sufficient proxy for actual injury data.

is 264, the predicted PFT score for men scoring in the middle third is 244, and the predicted PFT score for men scoring in the bottom third is only 224.

For women, the relationships are similar to those for men. Although the average score for the PFT taken at the end of recruit training for women is 250, the predicted PFT score for women scoring 300 on the DEP IST is 291, the predicted PFT score for women scoring in the top third (but not 300) is 267, the predicted PFT score for women scoring in the middle third is 251, and the predicted PFT score for women scoring in the bottom third is only 232.

We conclude, on average, that, for both women and men, recruits who have high scores on the DEP IST are predicted to have high scores on the PFT taken at the end of recruit training as well.

Table 2. Predicted[a] recruit training, first year, and second PFT scores by IST categories and gender

	Men			Women		
	Recruit training PFT	First year PFT	Second year PFT	Recruit training PFT	First year PFT	Second year PFT
300 IST	291	289	289	291	286	285
IST top third (but not 300)	264	260	264	267	255	259
IST middle third	244	240	245	251	234	240
IST bottom third	224	220	225	232	215	222
Average	244	240	244	250	235	241
Number of observations	229,635	179,287	171,055	16,824	13,034	12,357

Data Source: CNA Marine Corps personnel files

[a] The predictions are based on coefficient estimates in a tobit regression. These coefficient estimates are given in Table 20 to Table 22 in the appendix.

Although the DEP IST is a good predictor of PFT scores in the first two years of a Marine's initial enlistment, a significant number of men and women go from a low DEP IST to a high PFT, and from a high DEP IST to a low PFT. For example, we find that:

- 13.1 percent of the women who score in the bottom third of the DEP IST later score in the top third (but not 300) PFT at the end of recruit training.
- 13.5 percent of the women who score in the top third (but not 300) of the DEP IST later score in the bottom third of the PFT at the end of recruit training.

The findings for men were similar. These changes are due to both relative and absolute changes in Marines' measured fitness levels.

This suggests that MOS classification may need to be adjusted once final fitness scores are available at the end of recruit training. Otherwise, some men and women whose physical fitness level is lower than the DEP IST indicated may not succeed in physically demanding MOSs—and some who would succeed in those MOSs will miss opportunities because their DEP IST scores do not indicate their in-service physical fitness level.

We also examined the relationship between the DEP IST score and scores for various CFTs taken during a Marine's first enlistment, and found similar results.

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Glossary

CFT	Combat Fitness Test
DEP	Delayed Entry Program
DOD	Department of Defense
FAH	Flexed-Arm Hang
IST	Initial Strength Test
OLS	Ordinary Least Squares
MCFIP	Marine Corps Force Integration Plan
MCRD	Marine Corps Recruit Depot
MCRISS	Marine Corps Recruiting Information Support System
MCTIMS	Marine Corps Training Information Management System
MOS	Military Occupational Specialty
PEF	Program Enlisted For
PFT	Physical Fitness Test
TFDW	Total Force Data Warehouse

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Introduction

Now that the Department of Defense (DOD) has lifted combat exclusion provisions for women, the Marine Corps has been conducting a deliberate and measured effort to integrate women into ground combat units and Military Occupational Specialties (MOSs). Part of this effort has focused on understanding the physical requirements for closed MOSs and units, and how those requirements should inform changes to the Marine Corps' personnel classification and assignment policies. A key question in this effort has been: What physical fitness measures most reliably proxy the physical demands of duties in closed MOSs and units? Measurement options being considered have ranged from proxy tests uniquely tailored to the physical tasks for closed MOSs, to some combination of the individual events that are components of various Marine Corps physical fitness tests, including the Initial Strength Test (IST), Physical Fitness Test (PFT), and Combat Fitness Test (CFT). As discussed in this report, CNA's research is to exploring these options.

Here, we summarize CNA's research on the relationship between the first IST that an enlisted recruit takes while in the Delayed Entry Program (DEP) and early attrition; the relationship between the IST and injury rates in recruit training; and the relationship between the IST and the PFT and the CFT taken in recruit training and in the first and second years of service. These relationships are estimated separately for men and women. This report is the deliverable for Task 3A of the study *CNA Support to the Marine Corps Force Integration Plan (MCFIP).* The analysis is related to potential policies that could include the Marine Corps using a version of the DEP IST score as a criterion for classification into Programs Enlisted For (PEF) that contain physically demanding MOSs.[2]

[2] The IST was established in the early 1970s to provide a standard for determining whether recruits were physically ready to start recruit training. To date, it has not been used as a criterion for classification decisions or for any other recruit-related decisions.

Data

The data for DEP IST scores and attrition in the DEP are extracted from the Marine Corps Recruiting Information Support System (MCRISS). The data on attrition once the Marine enters the Marine Corps Recruit Depot (MCRD), and the data on all the PFTs and CFTs a Marine takes while in the Marine Corps, are extracted from Marine Corps Total Force Data Warehouse (TFDW) snapshots. We construct a proxy variable for whether a recruit is injured in recruit training, using a combination of MCRISS and Marine Corps Training Information Management System (MCTIMS) data. A recruit is defined as injured if he or she was discharged for medical reasons from recruit training or was medically recycled in his or her first attempt at recruit training.

Methodology

To study the relationship between the DEP IST and different indicators of a Marine's success in his or her first enlistment, we combine the three separate IST events—the 1.5-mile run, pull-ups/flexed-arm hang (FAH), and crunches—of the first IST test taken in DEP, to construct a composite score.[3] We measure the relationship between the *gender-normed IST score* and attrition rates, injury rates while in recruit training, and various *gender-normed PFT and CFT scores* taken during a Marine's initial enlistment.

Relationship between DEP IST score and three attrition rates

The variable of interest when analyzing attrition is a zero or one indicator variable that takes on a value of one if an enlisted Marine attrites during a specified time period in his or her career, and takes on a value of zero if the recruit successfully

[3] The maximum composite score for the IST is 300, the same as the maximum score for the PFT. For the crunches and pull-up/FAH components, the score for the IST is computed exactly the same as for the PFT, with a maximum of 100 points in each component, but, unlike the computation of PFT scores, there is no lower bound of 3 pull-ups (15 points), 40 crunches (40 points), and 15 seconds (15 points) on the FAH. For the 1.5-mile run, a time of 9 minutes or less for men and 10.5 minutes or less for women is given 100 points, with one point deducted for each additional five seconds over the respective 9-minute and 10.5-minute thresholds.

completes that time period in his or her career. We define three attrition indicator variables to capture three key time periods[4] in an enlisted Marine's career:

- during recruit training,
- before the completion of the first 24 months of service, and
- before the completion of the first 45 months of service.

To measure the relationship between the DEP IST and attrition during recruit training, we use two approaches. (The relationships between the DEP IST score and 24- and 45-month attrition are measured similarly.)

In the first approach, we classify[5] each recruit as being in the top third, the middle third, or the bottom third of the DEP IST scores of all recruits who accessed. This classification is done separately for men and women.

We then perform cross tabulations between the respective three thirds of IST scores and the attrition indicator variable for recruit training. These cross tabulations yield the following three percentages:

1. the percentage of Marines who were in the top third of DEP IST scores and attrited during recruit training;
2. the percentage of Marines who were in the middle third of DEP IST scores and attrited during recruit training; and
3. the percentage of Marines who were in the bottom third of DEP IST scores and attrited during recruit training.

In the second approach, we run a logit[6] regression, where the observed recruit training attrition indicator variable is the dependent variable and the DEP IST score is

[4] We also examined the relationship between IST score and DEP attrition, but 48 percent of DEP attrites were missing an IST score and we did not feel that the available data on IST scores for DEP attrites allowed for an in-depth analysis of the effect of IST score on DEP attrition. We did, however, analyze the relationship between DEP attrition and IST score using the data on the 52 percent of DEP attrites that did have an IST score. These results are presented in the appendix, in Table 26.

[5] For men and women who enter recruit training, a recruit is classified as being in the bottom third of the IST if his IST score was 163 or less (IST ≤ 163); if his IST score was higher than 163 but lower than 208 (164 ≤ IST ≤ 207) he was classified as being in the middle third; and if his IST was greater than 207 (IST ≥ 208) he was classified as being in the top third of the IST. For women, these respective cut-off points are: IST ≤ 154 for the bottom third; 155 ≤ IST ≤ 200 for the middle third; and IST ≥ 201 for the top third.

the main independent variable of interest. We also include variables in these logit regressions to control for other characteristics and factors that have been shown to affect attrition. These include: whether the recruit is high quality (i.e., a high school diploma graduate with a score of 50 or higher on the Armed Forced Qualification Test); the recruit's age, race/ethnicity, enlistment waivers, enlistment bonuses, and time in the DEP; the time of year at which the recruit was accessed; and the MCRD (i.e., San Diego or Parris Island) where the recruit was trained.[7]

A similar set of cross tabulations and logit regressions are done to measure the relationship between DEP IST score and 24- and 45-month attrition.

Relationship between DEP IST score and recruit training injury rates

For the injury indicator variable, we perform cross tabulations and conduct logit regression analysis similar to those described above for attrition. This indicator variable takes on a value of one if the recruit was injured during recruit training, and zero if the recruit was not injured during recruit training.

Relationship between DEP IST score and PFT and CFT scores

We first describe our methodology for measuring the relationship between DEP IST scores and PFT scores attained at the end of recruit training. The relationship between DEP IST scores and CFT scores attained at the end of recruit training, as well as the relationships between DEP IST scores and the first and second year PFT and CFT scores, are measured similarly. We measure all of these relationships with two approaches.

In the first approach, we classify each recruit as being in the top third, the middle third, or the bottom third of DEP IST scores of all recruits. In the top third, we further classify recruits who achieved the maximum score of 300 on the DEP IST. If a recruit's DEP IST score falls in the top third of all scores (but not 300), the recruit is classified as an IST top third recruit, and so forth. Finally, if the recruit achieves the maximum score of 300 on the DEP IST, the recruit is classified as an IST 300 recruit.

[6] The logit regression is similar to an ordinary least squares (OLS) regression, except that the logit regression has a non-linear rather than a linear functional form and the logit regression accounts for the fact that the observed attrition variable is bounded by zero and one.

[7] These same control variables are used for all logit and tobit regressions.

This gives us four categories[8] of recruits: (1) IST 300, (2) IST top third, (3) IST middle third, and (4) IST bottom third. This classification is done separately for men and women.

We perform this same classification of each Marine as being in either the top third (but not 300), middle third, or bottom third of observed PFT scores for all recruits at the end of recruit training. There also is a fourth category for recruits who have a PFT score of 300.[9] This classification is done separately for men and women. We then perform cross tabulations between the respective four categories of DEP IST scores and the four categories of recruit training PFT scores.

The second approach is to run a tobit[10] regression, where the observed PFT composite score is the dependent variable and the DEP IST score is the main independent variable of interest.

A similar set of cross tabulations are constructed and tobit regressions estimated for the CFT scores taken at the end of recruit training, as well as for the PFT and CFT scores taken during the first and second years of a Marine's initial enlistment.

[8] For men who take the final PFT in recruit training, a recruit is classified as being in the bottom third of the IST if his IST score was 165 or less (IST ≤ 165); if his IST score was higher than 165 but lower than 210 (166 ≤ IST ≤ 209) he is classified as being in the middle third; if his IST was greater than 209 but less than 300 (210 ≤ IST ≤ 299) he is classified as being in the top third of the IST, and if he scored a 300 he is classified as an IST 300 recruit. For women, these respective cut-off points are: IST ≤ 158 for the bottom third; 159 ≤ IST ≤ 204 for the middle third; 205 ≤ IST ≤ 299 for the top third; and IST 300.

[9] For men, a recruit is classified as being in the bottom third of the final recruit training PFT if his PFT score was 232 or less (PFT ≤ 232); if his PFT score was higher than 232 but lower than 262 (233 ≤ PFT ≤ 261) he is classified as being in the middle third; if his PFT was greater than 261 but less than 300 (262 ≤ PFT ≤ 299) he is classified as being in the top third of the PFT; and if he scored a 300 he is classified as being a 300 PFT recruit. For women, these respective cut-off points are: PFT ≤ 242 for the bottom third; 243 ≤ PFT ≤ 269 for the middle third; and 270 ≤ PFT ≤ 299 for the top third; and a 300 PFT recruit.

[10] The tobit regression is similar to an OLS regression, where the tobit regression accounts for the fact that observed PFT and CFT scores are censored from above by a score of 300 and censored from below by a score of 134.

Relationship Between DEP IST Scores and Attrition

In this section, we discuss the relationship between the DEP IST score and the attrition of Marine recruits in three[11] key time periods of their careers: (1) during recruit training, (2) before the completion of the first 24 months of service, and (3) before the completion of the first 45 months of service.

Relationship between DEP IST score and recruit training attrition

The relationship between the DEP IST score and attrition during recruit training at MCRD Parris Island or San Diego is summarized in Table 3 below and in Table 14 in the appendix.

Table 3 shows the relationship between three categories[12] of DEP IST scores (top third, middle third, and bottom third) and attrition rates in recruit training for both women and men.

From Table 3, we see that of the 257,398 men who entered recruit training between FY05 and FY13, 7.6 percent attrited before completing recruit training. Of the 21,923 women who entered recruit training between FY05 and FY13, 14.8 percent attrited before completing recruit training.

Although overall recruit training attrition for men was 7.6 percent, the attrition rate was only 4.7 percent for men who scored in the top third of the DEP IST and was 10.9

[11] We also analyzed the relationship between DEP attrition and the IST score. These results are summarized in Table 26 in the appendix.

[12] For men who entered recruit training, a recruit is classified as being in the bottom third of the IST if his IST score was 163 or less (IST $\leq$ 163); if his IST score was higher than 163 but lower than 208 (164 $\leq$ IST $\leq$ 207) he is classified as being in the middle third; and if his IST was greater than 207 (IST $\geq$ 208) he is classified as being in the top third of the IST. For women, these respective cut-off points are: IST $\leq$ 154 for the bottom third; 155 $\leq$ IST $\leq$ 200 for the middle third; and IST $\geq$ 201 for the top third.

percent for those who scored in the bottom third of the DEP IST. We find a similar pattern of attrition for women in Table 3. Although the overall recruit training attrition for women was 14.8 percent, from Table 3 we see that this attrition rate was only 9.8 percent for women who scored in the top third of the DEP IST and was 20.2 percent for women who scored in the bottom third.

From Table 3, we can conclude that the IST taken in DEP is a good predictor of success in recruit training. We investigate this relationship further with a logit regression equation, where the dependent variable is a zero or one indicator variable for recruit training attrition. The logit regression allows us to formally test whether the IST categories[13] shown in Table 3 are good predictors of recruit training attrition, while controlling for other factors that influence recruit training attrition, such as aptitude test scores, enlistment bonus, and accession year. These logit regression results are shown in Table 14 of the appendix.

From the coefficient estimates in Table 14 in the appendix, we see that being in the middle third or bottom third of the DEP IST scores increases attrition relative to the top IST group for both men and women.[14] The marginal changes (labeled "derivative" in the tables in the Appendix)[15] for the two IST category variables shown in Table 14

[13] We capture the impact of IST scores on recruit training attrition with two IST score indicator variables. The first IST score indicator variable, labeled "IST middle third," takes a value of 1 if the recruit scored in the middle third of the IST score and a value of zero otherwise. The second indicator variable to capture the impact of IST score on recruit training attrition is labeled "IST bottom third." This indicator variable takes a value of 1 if the recruit scored in the bottom third of the IST score, and zero otherwise. These two indicator variables allow us to compare these two categories of IST scores to the top third IST score category, which is in the "base group" of the logit regression.

[14] The z-statistics for both these coefficient estimates indicate that the coefficient estimates are statistically significantly different from zero. All reported differences from tobit and logit regression estimates throughout the remainder of this paper are statistically significant unless otherwise indicated.

[15] For men, the "marginal change" shown in Table 14 in the Appendix (labeled "derivative" in the tables in the Appendix) for the IST middle third and IST bottom third coefficients were computed as follows. First, based on the coefficients given in Table 14 for men, we predict the probability of attrition for each man in the sample assuming he was in the top third of the IST distribution, and then compute the average of these predictions. Doing this for the sample of 257,385 men in our dataset, we get an average predicted attrition rate of 5.1 percent if all men in the sample were in the top third IST group. Second, based on the coefficients given in Table 14 for men, we predict the probability of attrition for each man in the sample assuming he was in the middle third of the IST distribution, and then compute the average of these predictions. Doing this for the sample of 257,385 men in our dataset, we get an average predicted attrition rate of 7.1 percent if all men in the sample were in the middle third IST score. Third, based on the coefficients given in Table 14 for men, we predict the probability of attrition for each man in the sample assuming he was in the bottom third of the IST distribution, and then compute the average of these predictions. Doing this for the sample of 257,385 men in our dataset, we get an average predicted attrition rate of 10.2 percent if all men in the sample were in the

imply that male recruits in the IST middle third have a 2-percentage-point higher attrition rate, and those in the IST bottom third have a 5.2-percentage-point higher attrition rate, than those in the IST top third. The marginal changes of the two IST category variables in Table 14 for female recruits imply that female recruits in the IST middle third have a 4.1-percentage-point higher attrition rate, and those in the IST bottom third have a 9.6-percentage-point higher attrition rate, than those in the IST top third.

Table 3. Recruit training attrition rates by DEP IST categories and gender, FY05–FY13 accessions

	Men		Women	
	Total recruits	Attrition	Total recruits	Attrition
IST top third	84,440	4.7%	7,244	9.8%
IST middle third	86,395	7.1%	7,319	14.3%
IST bottom third	86,563	10.9%	7,360	20.2%
Total	257,398	7.6%	21,923	14.8%

Source: CNA Marine Corps personnel files

Relationship between DEP IST score and 24-month attrition

The relationship between the DEP IST score and attrition during the first 24 months of service in the Marine Corps is summarized in Table 4 below and in Table 15 in the appendix.

Table 4 shows the relationship between three categories of DEP IST scores (top third, middle third, and bottom third) and the overall attrition rates in the first 24 months of service[16] for both male and female Marines. As with recruit training attrition, the

bottom third IST group. Finally, taking the difference between 7.1 percent and 5.1 percent, we get the 2.0 percent impact of being in the middle third versus the top third IST group shown in Table 14; and taking the difference between 10.2 percent and 5.1 percent, we get the 5.1 percent impact of being in the bottom third of the IST group shown in Table 14.

[16] We are looking at total attrition over the 24-month period, not attrition conditional on having completed recruit training. So while 22.3 percent of the 17,311 women in the sample attrited over the 24-month period, 16.0 percent of these women attrited in recruit training, and only 7.3 percent of them attrited between recruit training and 24 months of service. For the 207,364

relationship between the three categories of IST scores and overall attrition continues to be strong after 24 months of service. Moreover, the differences between the three IST categories are as large as, or even larger than, they were for recruit training attrition. This suggests that the DEP IST captures fairly persistent differences in attrition over time.

Table 4. 24-month attrition rates by DEP IST categories and gender, FY05 –FY12 accessions

	Men		Women	
	Total recruits	Attrition	Total recruits	Attrition
IST top third	63,815	10.0%	5,427	16.2%
IST middle third	69,222	13.2%	5,771	21.9%
IST bottom third	74,327	17.1%	6,113	28.1%
Total	207,364	13.6%	17,311	22.3%

Source: CNA Marine Corps personnel files

From Table 4, we can conclude that the IST taken in DEP is a good predictor of success in the first two years of service. As we did with recruit training attrition, we investigate this relationship further with a logit regression equation, where the dependent variable is a zero or one indicator variable for overall attrition in the first 24 months of service. These logit regression results are shown in Table 15 of the appendix.

From the coefficient estimates in Table 15 in the appendix, we see that both men and women in the IST middle third or IST bottom third have higher 24-month attrition rates than those in the IST top third. The marginal changes for the two IST category variables shown in Table 15 imply that male recruits in the IST middle third have a 2.4-percentage-point higher overall 24-month attrition rate, and those in the IST bottom third have a 5.7-percentage-point higher overall 24-month attrition rate, than those in the IST top third. The corresponding marginal changes for female recruits imply that female recruits in the IST middle third have a 5.1-percentage-point higher overall 24-month attrition rate, and those in the IST bottom third have an 11.0-

men in the sample, 13.6 percent of them attrited over the 24-month period, but 8.4 percent of these men attrited in recruit training, and only 5.2 percent of them attrited between recruit training and 24 months of service.

percentage-point higher overall 24-month attrition rate, than those in the IST top third.

Relationship between DEP IST score and 45-month attrition

The relationship between the DEP IST score and attrition during the first 45 months of service in the Marine Corps is summarized in Table 5 below and in Table 16 of the appendix.

Table 5 shows the relationship between the three categories of DEP IST scores and attrition rates in the first 45 months of service[17] for both male and female Marines. As with recruit training attrition and overall 24-month attrition, the relationship between the three categories of IST scores and attrition continues to be strong after 45 months of service.

[17] We are looking at total attrition over the 45-month period, not attrition conditional on having completed 24 months of service. While 29.9 percent of the 12,938 women in the sample attrited over the 45-month period, 17.2 percent of these women attrited in recruit training, 7.0 percent of these women attrited between recruit training and 24 months of service, and only 5.7 percent of them attrited between 24 and 45 months of service. For the 159,625 men in the sample, 20.3 percent of them attrited over the 45-month period, but 9.0 percent of these men attrited in recruit training, 5.5 percent of these men attrited between recruit training and 24 months of service, and only 5.8 percent of them attrited between 24 and 45 months of service. For women, 57.5 percent of 45-month attrition occurred during recruit training—for men, this percentage was only 44.3.

Table 5. 45-month attrition rates by DEP IST categories and gender, FY05 –FY10 accessions

	Men		Women	
	Total recruits	Attrition	Total recruits	Attrition
IST top third	44,003	15.7%	3,758	23.4%
IST middle third	52,545	19.6%	4,279	29.4%
IST bottom third	63,077	24.2%	4,901	35.2%
Total	159,625	20.3%	12,938	29.9%

Source: CNA Marine Corps personnel files

From Table 5, we can conclude that the DEP IST is a good predictor of success up to 45 months of service. Again, we investigate this relationship further with a logit regression equation, where the dependent variable in the logit regression equation is a zero or one indicator variable for attrition in the first 45 months of service. These logit regression results are shown in Table 16 of the appendix.

From the coefficient estimates in Table 16, we see that both male and female recruits in the IST middle third or IST bottom third have a higher attrition rate at 45 months than those in the IST top third. The marginal changes for the two IST category variables shown in Table 16 imply that male recruits in the IST middle third have a 3.1-percentage-point higher overall 45-month attrition rate, and those in the IST bottom third have a 7.5-percentage-point higher overall 45-month attrition rate, than those in the IST top third. The corresponding marginal changes for female recruits imply that female recruits in the IST middle third have a 5.5-percentage-point higher overall 45-month attrition rate, and those in the IST bottom third have an 11.4-percentage-point higher rate, than those in the IST top third.

Relationship between DEP IST score and conditional 24-month and 45-month attrition

The attrition rates at 24 months of service, given that the recruit completes recruit training, and the attrition rates at 45 months, given that the recruit completes 24

months of service, are known as *conditional attrition rates.*[18] They are shown in Table 6 by IST third.

Table 6. Conditional attrition probabilities to 24 and 45 months by IST category and gender

	Men			Women		
	Recruit training attrition	Conditional probability of attrition before 24 months of service	Conditional probability of attrition before 45 months	Recruit training attrition	Conditional probability of attrition before 24 months of service	Conditional probability of attrition before 45 months
IST top third	4.7%	5.6%	6.3%	9.8%	7.1%	8.6%
IST middle third	7.1%	6.5%	7.4%	14.3%	8.9%	9.6%
IST bottom third	10.9%	6.9%	8.6%	20.2%	9.9%	9.9%
Overall	7.6%	6.5%	7.8%	14.8%	8.8%	9.7%

Source: CNA Marine Corps personnel files

The relationship between the three DEP IST categories and conditional attrition continues to be strong and persistent after both 24 and 45 months of service. The 24-month attrition rates, conditional on having completed recruit training, for those in the IST top third are lower than those for Marines in the IST middle and bottom thirds. Similarly, 45-month attrition rates, conditional on having completed 24 months of service, for those in the IST top third are lower than those for Marines in the IST middle and bottom thirds. These relationships hold up equally well for both men and women.

From Table 6, we can conclude that the DEP IST is a good predictor of success in the first 24 months of service, given that a Marine completed recruit training, as well as a good predictor of success between 24 and 45 months of service, given that a Marine

[18] To compute the conditional probability we use the rule P(B|A) = P(A, B)/P(A), where P(A, B) is the joint probability of completing recruit training (event A) and attriting before the completion of 24 months of service but after recruit training (event B), and P(B|A) is the conditional probability of B given that A occurred. For our purposes, this conditional probability is the probability of attrition before the completion of 24 months of service but after recruit training (event B), given that the recruit completed recruit training (event A). Similarly, we can compute the conditional probability of attriting before the completion of 45 months of service, given that a Marine completed 24 months of service.

successfully completed 24 months of service. As we did with the other attrition rates, we investigate the relationships further with a logit regression equation, where the dependent variable in the logit regression equation is a zero or one indicator variable for attrition. These conditional logit regression results are shown in Table 17 (for 24 months of service) and Table 18 (for 45 months of service).

From the coefficient estimates in Table 17, we see that both men and women in the IST middle and bottom thirds have higher conditional 24-month attrition rates than those in the IST top third. The marginal changes for the two IST category variables shown in Table 14 imply that male Marines in the IST middle third have a (relatively small) 0.7-percent-percentage point higher conditional 24-month attrition rate, and those in the IST bottom third have a 1-percentage-point higher conditional 24-month attrition rate, than those in the IST top third.

The marginal changes of the two IST category variables in Table 17 also indicate that female Marines in the IST middle third have a 1.3-percentage-point higher conditional 24-month attrition rate, and those in the bottom IST third have a 2.3-percentage-point higher conditional 24-month attrition rate, than those in the IST top third.

From the coefficient estimates in Table 18 in the appendix, we see that both men and women in the IST middle and bottom thirds have a higher conditional 45-month attrition rate than those in the IST top third, although for women the effect is smaller than the effect for the conditional 24-month attrition rate, and the coefficient estimates are not statistically significantly different from zero for women. The marginal changes for the two IST category variables shown in Table 18 imply that male recruits in the IST middle third have a (relatively small) 0.8 -percentage-point higher conditional 45-month attrition rate, and those in the IST bottom third have a 2-percentage-point higher conditional 45-month attrition rate, than those in the IST top third.

The marginal changes of the two IST category variables in Table 18 also indicate that female Marines in the IST middle third have a (small) 0.4-percentage-point higher conditional 45-month attrition rate, and those in the IST bottom third have a (small) 0.7-percentage-point higher conditional 45-month attrition rate, than those in the IST top third, although the coefficient estimates underlying both of these percentage attrition impacts are not statistically significantly different from zero.

Relationship Between DEP IST Scores and Recruit Training Injuries

In this section, we discuss the relationship between DEP IST scores and the probability of being injured while in recruit training. This relationship is summarized in Table 7 below and in Table 19 in the appendix. We analyze only recruits who trained at Parris Island, since data were not available for those in San Diego.

We construct a proxy variable for whether a recruit is injured in recruit training using a combination of MCRISS and MCTIMS data. The recruit is defined as injured if he or she was discharged for medical reasons from recruit training or was medically recycled in his or her first attempt at recruit training.

Table 7 shows the relationship between our categories of DEP IST scores and injury rates in recruit training for both men and women. From Table 7, we see a slight negative relationship between the three categories of IST scores and injury rate in recruit training: those who received higher IST scores have lower injury rates. For men, the injury rate is 2.4 percent for recruits in the IST top third, 3.6 for those in the IST middle third, and 4.6 percent for those in the IST bottom third. For women, the injury rates are 4.6 percent for recruits in the IST top third, 5.8 percent for those in the IST middle third, and 7.6 percent for those in the IST bottom third. The overall injury rates are 3.6 percent for men and 6.0 percent for women.

Table 7. Recruit training injury rates by DEP IST categories and gender, FY05 –FY13 accessions

	Men		Women	
	Total recruits	Injuries	Total recruits	Injuries
IST top third	33,833	2.4%	5,931	4.6%
IST middle third	34,706	3.6%	5,985	5.8%
IST bottom third	34,770	4.6%	6,058	7.6%
Total	103,309	3.6%	17,974	6.0%

Source: CNA Marine Corps personnel files

From Table 7, we can conclude that the DEP IST is a good predictor of injury rates in recruit training. As we did with our analysis of attrition rates, we further investigate the relationship between the DEP IST scores and injury rates by conducting a logit regression equation, where the dependent variable is an indicator variable that takes on the value of one if the recruit was injured in recruit training, and zero otherwise. These logit regression results are shown in Table 19 of the appendix.

From the coefficient estimates in Table 19, we see that those in the IST middle or bottom third have a greater likelihood of being injured in recruit training than those in the top IST group, for both men and women. The marginal changes for the two IST category variables shown in Table 19 imply that male recruits in the IST middle third have a 1.2-percentage-point higher injury rate, and those in the IST bottom third have a 2.2-percentage-point higher injury rate, than those in the IST top third. The marginal changes of the two IST category variables in Table 19 for female recruits imply that female recruits in the IST middle third have a 1.2-percentage-point higher injury rate, and those in the IST bottom third have a 3.0-percentage-point higher injury rate, than those in the IST top third.

Relationship Between DEP IST Scores and PFT and CFT Scores

In this section, we discuss the relationship between the DEP IST score and the PFT and CFT scores attained at the end of recruit training, as well as the relationship between the DEP IST score and the first and second annual PFT and CFT scores attained in a Marine's early career.

Relationship between DEP IST score and final recruit training PFT score

The relationship between the DEP IST score and the final recruit training PFT score is summarized in Table 8 below and in Table 20 in the appendix.

Table 8 shows the relationship between the four categories[19] of DEP IST scores and four categories of final recruit training PFT[20] scores.[21]

[19] For men who took the final PFT in recruit training, a recruit is classified as being in the bottom third of the IST if his IST score was 165 or less (IST ≤ 165); if his IST score was higher than 165 but lower than 210 (166 ≤ IST ≤ 209) he is classified as being in the middle third; and if his IST score was greater than 209 but less than 300 (210 ≤ IST ≤ 299) he is classified as being in the top third of the IST, but not 300. For women, these respective cut-off points are: IST ≤ 158 for the bottom third; 159 ≤ IST ≤ 204 for the middle third; and 205 ≤ IST ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for recruits who had an IST score of 300.

[20] For men, a recruit is classified as being in the bottom third of the final recruit training PFT if his PFT score was 232 or less (PFT ≤ 232); if his PFT score was higher than 232 but lower than 262 (233 ≤ PFT ≤ 261) he is classified as being in the middle third; and if his PFT was greater than 261 but less than 300 (262 ≤ PFT ≤ 299) he is classified as being in the top third of the PFT, but not 300. For women, these respective cut-off points are: PFT ≤ 242 for the bottom third; 243 ≤ PFT ≤ 269 for the middle third; and 270 ≤ PFT ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for recruits who had a final recruit training PFT score of 300.

[21] While the average difference between the PFT scores taken at the end of recruit training and the IST scores taken when the recruit first enters the DEP is an increase of 55 points, for those

Table 8. Relationship between DEP IST categories and recruit training PFT categories by gender, FY05-FY13 accessions

	Men					Women				
	Total recruits	PFT 300 (%)	PFT top third (but not 300) (%)	PFT middle third (%)	PFT bottom third (%)	Total recruits	PFT 300 (%)	PFT top third (but not 300) (%)	PFT middle third (%)	PFT bottom third (%)
IST 300	778	21.7%	71.7%	4.1%	2.4%	85	23.5%	65.9%	9.4%	1.2%
IST top third (but not 300)	74,706	1.7%	57.9%	30.7%	9.8%	5,503	2.1%	52.2%	32.3%	13.5%
IST middle third	77,550	0.2%	26.2%	41.9%	31.7%	5,624	0.4%	28.3%	38.3%	33.0%
IST bottom third	76,602	0.1%	10.9%	28.5%	60.5%	5,612	0.1%	13.1%	30.4%	56.3%
Total	229,636	0.7%	31.5%	33.6%	34.1%	16,824	1.0%	31.3%	33.5%	34.2%

Source: CNA Marine Corps personnel files

We can draw two conclusions from the cross tabulations shown in Table 8 between DEP IST scores and final PFT scores at the end of recruit training. First, the DEP IST score is a good predictor of the PFT score attained at the end of recruit training. Second, a significant number of men and women change categories between the DEP IST and the final PFT taken at the end of recruit training. For example, 13.1 percent of the women who scored in the IST bottom third later scored in the PFT top third at the end of recruit training, and 13.5 percent of the women who scored in the IST top third later scored in the PFT bottom third at the end of recruit training. Eleven percent of the men who scored in the IST bottom third later scored in the PFT top third (including 300) at the end of recruit training, and 9.8 percent of the men who score in the IST top third later scored in the PFT bottom third at the end of recruit training. This suggests that any classifications to MOSs that depend on physical fitness should not be finalized until the end of recruit training.

recruits who went from the top third in the IST score to the bottom third in the PFT score, the average difference between the PFT and IST scores is a decrease of 13 points.

We further investigated the relationship between DEP IST and PFT at the end of recruit training with a tobit[22] regression equation. In the tobit regression, the dependent variable is the PFT score a recruit receives at the end of recruit training. The tobit regression allows us to formally test whether the IST categories shown in Table 8 are good predictors of PFT scores at the end of recruit training, while controlling for other factors. These tobit regression results are shown in Table 20 of the appendix.

From Table 20, we see from both the coefficient estimate and the marginal change[23] that men who have a 300 score on the DEP IST later score, on average, 27.2 points higher on the PFT taken at the end of recruit training than similar men who are in the IST top third (but not 300) category. Men who are in the IST middle third later have, on average, a final PFT score in recruit training that is 19.6 points lower, and those in the IST bottom third later have a final PFT score that is 38.3 points lower, than similar men who are in the IST top third (but not 300) category.

Also in Table 20, we see that the pattern for women is similar to that for men in terms of the relationship between the DEP IST score and the PFT score attained at the end of recruit training. Women who have a 300 score on the DEP IST later score, on average, 23.8 points higher on the PFT taken at the end of recruit training than similar women who are in the IST top third (but not 300) category. Women in the IST middle third later have, on average, a final PFT score in recruit training that is 16.2 points lower, and those in the IST bottom third later have a final PFT score that is 33.8 points lower, than similar women who are in the IST top third (but not 300) category.

Relationship between DEP IST score and first annual PFT score

The relationship between the DEP IST score and the first annual PFT score is summarized in Table 9 below and in Table 21 in the appendix.

[22] As discussed earlier, the tobit regression is similar to an OLS regression, where the tobit regression accounts for the fact that observed PFT and CFT scores are censored from above by a score of 300 and from below by a score of 134.

[23] Unlike the logit model, which uses a non-linear equation to predict attrition rates, the tobit model uses a linear equation to predict PFT scores (if we want to predict scores below 134 and above 300). Hence, for the tobit model, the derivative is the same as the coefficient, but we give the derivative column in the tobit results in the appendix for completeness.

Table 9 shows the relationship between the same four categories[24] of DEP IST scores previously defined, and four categories[25] of the first annual PFT taken in a Marine's career. As with the relationship between the DEP IST and the PFT taken at the end of recruit training, from Table 9 we see a strong positive relationship between DEP IST scores and first annual PFT scores for both men and women. Men and women who do well on the DEP IST also tend to do well in the first annual PFT, and men and women who score poorly on the DEP IST also tend to do poorly on the first annual PFT.

However, we also see from Table 9 that a significant number of men and women change categories between the DEP IST and the first annual PFT. For example, 12.7 percent of men in the IST bottom third later score in the top third (but not 300) of the first annual PFT, and 11.4 percent of men in the IST top third (but not 300) category later score in the bottom third of the first annual PFT. A similar pattern holds for women, as shown in Table 9. For example, 16.7 percent of women in the IST bottom third later score in the top third (but not 300) of the first annual PFT, and 15.0 percent of women in the IST top third (but not 300) category later score in the bottom third of the first annual PFT.

[24] We exclude most Marines who accessed in FY13 from this analysis since they have not yet had a chance to complete one year of service. Since we have a slightly different sample of Marines who took the first annual PFT than we had for the PFT taken at the end of recruit training, the cut-off points for the three categories of "IST thirds" are slightly different from those reported earlier. For men who have had the opportunity to complete one year of service, a Marine is classified as being in the bottom third of the IST if his IST score was 164 or less (IST ≤ 164); if his IST score was higher than 164 but lower than 208 (165 ≤ IST ≤ 207) he is classified as being in the middle third; and if his IST was greater than 207 but less than 300 (208 ≤ IST ≤ 299) he is classified as being in the top third of the IST, but not 300. For women, these respective cut-off points are: IST ≤ 157 for the bottom third; 158 ≤ IST ≤ 204 for the middle third; and 205 ≤ IST ≤ 299 for the top third. For both men and women, there is a fourth category for those who had an IST score of 300.

[25] For men, a Marine is classified as being in the bottom third of the first annual PFT if his PFT score was 228 or less (PFT ≤ 228); if his PFT score was higher than 228 but lower than 260 (229 ≤ PFT ≤ 259) he is classified as being in the middle third; and if his PFT was greater than 259 but less than 300 (260 ≤ PFT ≤ 299) he is classified as being in the top third of the PFT, but not 300. For women, these respective cut-off points are: PFT ≤ 225 for the bottom third; 226 ≤ PFT ≤ 261 for the middle third; and 262 ≤ PFT ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for Marines who had a first annual PFT score of 300.

Table 9. Relationship between DEP IST categories and first year PFT categories by gender, FY05-FY12 accessions

	Men					Women				
	Total recruits	PFT 300 (%)	PFT top third (but not 300) (%)	PFT middle third (%)	PFT bottom third (%)	Total recruits	PFT 300 (%)	PFT top third (but not 300) (%)	PFT middle third (%)	PFT bottom third (%)
IST 300	627	18.3%	74.2%	5.7%	1.8%	66	18.2%	69.7%	9.1%	3.0%
IST top third (but not 300)	58,749	2.2%	55.2%	31.2%	11.4%	4,222	2.4%	50.0%	32.7%	15.0%
IST middle third	58,875	0.4%	27.4%	39.7%	32.5%	4,375	0.6%	28.5%	36.6%	34.3%
IST bottom third	61,036	0.2%	12.7%	29.6%	57.6%	4,371	0.2%	16.7%	30.7%	52.4%
Total	179,287	1.0%	31.7%	33.3%	34.0%	13,034	1.1%	31.7%	33.2%	33.9%

Source: CNA Marine Corps personnel files

We further investigate the relationship between the DEP IST and the first annual PFT with a tobit regression equation, where the dependent variable is the first annual PFT score that a Marine achieves after recruit training. The tobit regression allows us to formally test whether the IST categories shown in Table 9 are good predictors of the first annual PFT score, while controlling for other factors. These tobit regression results are shown in Table 21 of the appendix.

From Table 21 in the appendix, we see from both the coefficient estimate and the marginal changes that men who have a 300 score on the DEP IST later score, on average, 28.8 points higher on the first annual PFT than similar men who are in the IST top third (but not 300) category. Men in the IST middle third later have, on average, a first annual PFT score that is 20.6 points lower, and men in the IST bottom third later have a first annual PFT score that is 40.3 points lower, than similar men who are in the IST top third (but not 300) category.

Also in Table 21, we see a similar pattern for women. Women who score 300 on the DEP IST later score, on average, 31.6 points higher on the first annual PFT than similar women who are in the IST top third (but not 300) category. Women in the IST middle third have, on average, a first annual PFT score that is 20.9 points lower, and women in the IST bottom third have a first annual PFT score that is 39.4 points lower, than similar women who are in the IST top third (but not 300) category.

In summary, those who perform well on the DEP IST also perform well on the PFT after the first year of service.

Relationship between DEP IST score and second annual PFT score

The relationship between the DEP IST score and the second annual PFT score is summarized in Table 10 below and in Table 22 in the appendix.

Table 10 shows the cross tabulations between the four categories[26] of IST scores and the four categories[27] of the second annual PFT taken in a Marine's career. As with the relationship between the DEP IST and the PFTs taken at the end of recruit training and at the end of the first year of service, there continues to be a strong positive relationship between DEP IST scores and second annual PFT scores for both men and women. Men and women who do well on the IST also tend to do well on the second annual PFT, and those who score poorly on the IST also tend to score poorly on the second annual PFT.

However, we also see from Table 10 that a significant number of men and women change categories between the DEP IST and the second annual PFT. For example, 13.7 percent of men in the bottom third of the DEP IST later score in the top third (but not 300) of the second annual PFT, and 12.0 percent of men in the top third (but

[26] We exclude most Marines who accessed after FY11 from this analysis since they have not yet had a chance to complete two years of service. Since we have a slightly different sample of Marines who took the second annual PFT than we had for the PFT taken at the end of recruit training or at the end of the first year of service, the cut-off points for the three categories of "IST thirds" are slightly different from the IST cut-off points taken at the end of recruit training and at the end of the first year of service. For men who took the second year PFT, a Marine is classified as being in the bottom third of the IST score if his IST score was 163 or less (IST ≤ 163); if his IST score was higher than 163 but lower than 208 (164 ≤ IST ≤ 207) he is classified as being in the middle third; and if his IST was greater than 207 but less than 300 (208 ≤ IST ≤ 299) he is classified as being in the top third of the IST, but not 300. For women, these respective cut-off points are: IST ≤ 156 for the bottom third; 157 ≤ IST ≤ 202 for the middle third; and 203 ≤ IST ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for those who had an IST score of 300.

[27] For men, a Marine is classified as being in the bottom third of the second annual PFT if his PFT score was 233 or less (PFT ≤ 233); if his PFT score was higher than 233 but lower than 266 (234 ≤ PFT ≤ 265) he is classified as being in the middle third; and if his PFT was greater than 265 but less than 300 (266 ≤ PFT ≤ 299) he is classified as being in the top third of the PFT, but not 300. For women, these respective cut-off points are: PFT ≤ 232 for the bottom third; 233 ≤ PFT ≤ 265 for the middle third; and 266 ≤ PFT ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for Marines who had a second annual PFT score of 300.

not 300) of the DEP IST later score in the bottom third of the second annual PFT. A similar pattern holds for women in Table 10. For example, 17.3 percent of women in the IST bottom third later score in the top third (but not 300) of the second annual PFT, and 15.7 percent of women in the IST top third (but not 300) later score in the bottom third of the second annual PFT.

Table 10. Relationship between DEP IST categories and second year PFT categories by gender, FY05-FY11 accessions

	Men					Women				
	Total recruits	PFT 300 (%)	PFT top third (but not 300) (%)	PFT middle third (%)	PFT bottom third (%)	Total recruits	PFT 300 (%)	PFT top third (but not 300) (%)	PFT middle third (%)	PFT bottom third (%)
IST 300	584	18.8%	70.6%	8.6%	2.1%	63	17.5%	66.7%	15.9%	0.0%
IST top third (but not 300)	55,324	2.9%	52.9%	32.2%	12.0%	4,041	2.7%	48.9%	32.7%	15.7%
IST middle third	57,418	0.7%	27.8%	38.8%	32.7%	4,125	1.3%	28.4%	36.3%	33.9%
IST bottom third	57,730	0.3%	13.7%	29.7%	56.3%	4,128	0.4%	17.3%	29.6%	52.7%
Total	171,056	1.4%	31.3%	33.5%	33.9%	12,357	1.5%	31.6%	32.8%	34.1%

Source: CNA Marine Corps personnel files

We further investigate the relationship between DEP IST and the second annual PFT with a tobit regression equation, where the dependent variable is the second annual PFT score that a Marine achieves after recruit training. The tobit regression allows us to formally test whether the IST categories shown in Table 10 are good predictors of the second annual PFT score, while controlling for other factors. These tobit regression results are shown in Table 22 of the appendix.

From Table 22 in the appendix for men, we see from both the coefficient estimate and the marginal changes that men who have a 300 score on the DEP IST later score, on average, 24.9 points higher on the second annual PFT than similar men who are in the IST top third (but not 300) category. Men who are in the IST middle third later have, on average, a second annual PFT score that is 19.4 points lower, and men who are in the IST bottom third later have a second annual PFT score that is 38.9 points lower, than similar men in the IST top third (but not 300) category.

In Table 22, we see that the pattern for women is similar to that for men. Women who score a 300 on the DEP IST later score, on average, 25.3 points higher on the second annual PFT than similar women in the IST top third (but not 300) category. Women in the IST middle third later have, on average, a second annual PFT score that is 18.9 points lower, and women who are in the IST bottom third later have a second

annual PFT score that is 37 points lower, than similar women in the IST top third (but not 300) category.

In summary, those who perform well on the DEP IST continue to perform well on the PFT after the second year of service.

Relationship between DEP IST score and final recruit training CFT score

The relationship between the DEP IST score and the final CFT score at the end of recruit training is summarized in Table 11 below and in Table 23 in the appendix.

Table 11 shows the cross tabulations between four categories[28] of DEP IST scores and four categories[29] of final CFT scores at the end of recruit training. As with the relationship between the DEP IST and the PFT taken at the end of recruit training, Table 11 shows a strong positive relationship between DEP IST scores and CFT scores attained at the end of recruit training for both men and women. Men and women who do well on the IST also tend to do well on the CFT taken at the end of recruit training, and men and women who score poorly on the IST also tend to score poorly on the CFT taken at the end of recruit training.

[28] For men who took the final recruit training CFT, a recruit is classified as being in the bottom third of the IST if his IST score was 176 or less (IST ≤ 176); if his IST score was higher than 176 but lower than 219 (177 ≤ IST ≤ 218) he is classified as being in the middle third; and if his IST was greater than 218 but less than 300 (219 ≤ IST ≤ 299) he is classified as being in the top third of the IST, but not 300. For women, these respective cut-off points are: IST ≤ 163 for the bottom third; 164 ≤ IST ≤ 210 for the middle third; and 211 ≤ IST ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for recruits who had an IST score of 300.

[29] For men, a recruit is classified as being in the bottom third of the final recruit training CFT if his CFT score was 278 or less (CFT ≤ 278); if his CFT score was higher than 278 but lower than 291 (279 ≤ CFT ≤ 290) he is classified as being in the middle third; and if his CFT was greater than 290 but less than 300 (291 ≤ CFT ≤ 299) he is classified as being in the top third of the CFT, but not 300. For women, these respective cut-off points are: CFT ≤ 274 for the bottom third; 275 ≤ CFT ≤ 289 for the middle third; and 290 ≤ CFT ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for recruits who had a final recruit training CFT score of 300.

Table 11. Relationship between DEP IST categories and recruit training CFT categories by gender, FY05-FY13 accessions

	Men					Women				
	Total recruits	CFT 300 (%)	CFT top third (but not 300) (%)	CFT middle third (%)	CFT bottom third (%)	Total recruits	CFT 300 (%)	CFT top third (but not 300) (%)	CFT middle third (%)	CFT bottom third (%)
IST 300	419	31.7%	36.0%	22.2%	10.0%	44	34.1%	36.4%	15.9%	13.6%
IST top third (but not 300)	35,147	11.8%	33.2%	33.5%	21.5%	3,046	11.8%	32.8%	35.3%	20.1%
IST middle third	35,841	5.4%	24.8%	37.2%	32.5%	3,101	4.5%	25.4%	36.7%	33.5%
IST bottom third	36,019	2.5%	15.7%	34.3%	47.5%	3,096	1.8%	16.6%	33.4%	48.2%
Total	107,426	6.6%	24.6%	35.0%	33.9%	9,287	6.1%	25.0%	35.1%	33.9%

Source: CNA Marine Corps personnel files

However, we also see from Table 11 that a significant number of men and women change categories between the DEP IST and the CFT taken at the end of recruit training. For example, 18.2 percent (2.5 percent plus 15.7 percent) of men in the IST bottom third later either score 300 on the CFT or score in the top third (but not 300) of the CFT taken at the end of recruit training, and 21.5 percent of men in the IST top third (but not 300) group score in the bottom third of the CFT taken at the end of recruit training. Also, 10 percent of men that scored 300 or higher in the IST were in the bottom third of the CFT taken at the end of recruit training A similar pattern holds for women, as shown in Table 11. For example, 18.4 percent (1.8 percent plus 16.6 percent) of women in the IST bottom third later either score 300 on the CFT taken at the end of recruit training or score in the top third (but not 300) of the CFT taken at the end of recruit training, and 20.1 percent of women in the IST top third (but not 300) group later score in the bottom third of the recruit training CFT. Also, 13.6 percent of women that scored 300 or higher in the IST were in the bottom third of the CFT taken at the end of recruit training As we find with the PFT taken at the end of recruit training, this suggests that any MOS classifications that depend on physical fitness should not be finalized until the end of recruit training.

We further investigate the relationship between the DEP IST and the CFT in recruit training with a tobit regression equation. In the tobit regression, the dependent variable is the CFT score a recruit receives at the end of recruit training. The tobit regression allows us to formally test whether the IST categories shown in Table 11

are good predictors of CFT scores at the end of recruit training, while controlling for other factors. These tobit regression results are shown in Table 23 of the appendix.

From Table 23 in the appendix, we see that men who score a 300 on the DEP IST will score, on average, 8.9 points higher on the CFT taken at the end of recruit training than similar men who are in the IST top third (but not 300) category. Men in the IST middle third later have, on average, a final CFT score in recruit training that is 5 points lower than similar men in the IST top third (but not 300) group. Finally, men in the IST bottom third later have a final CFT score that is 10.3 points lower than similar men who are in the IST top third (but not 300) category.

In Table 23, we see that the pattern for women is similar to that for men. Women who score a 300 on the DEP IST later score, on average, 7.8 points higher on the CFT at the end of recruit training than similar women who are in the IST top third (but not 300) category. Women in the IST middle third later have, on average, a final CFT score in recruit training that is 5.8 points lower, and women in the IST bottom third, later have a final PFT score that is 11 points lower, than similar women who are in the IST top third (but not 300) category.

In summary, comparing the IST category marginal changes in the tobit regression estimates for both men and women shown in Table 23 for the CFT taken at the end of recruit training to those in Table 20 for the PFT taken at the end of recruit training, we see that the effect of the IST category on CFT score at the end of recruit training is positive, but smaller, than the effect of the IST score on the PFT taken at the end of recruit training. However, these effects still indicate a positive relationship between DEP IST and recruit training CFT scores.

Relationship between DEP IST score and first annual CFT score

The relationship between DEP IST and first annual CFT scores is summarized in Table 12 below and in Table 24 in the appendix.

Table 12 shows the relationship between four categories[30] of DEP IST scores and four categories[31] of CFT scores for those taken in the first year of a Marine's career. As with the relationship between the DEP IST and the CFT taken at the end of recruit training, from Table 12 we see a strong positive relationship between IST scores and first annual CFT scores for both men and women. Men and women who do well on the IST also tend to do well on the first annual CFT, and men and women who do poorly on the IST also tend to do poorly on the first annual CFT.

However, we also see from Table 12 that a significant number of men and women change categories between the DEP IST and the first annual CFT. For example, 19.5 percent (5.4 percent plus 14.1 percent) of men in the IST bottom third later either score 300 on the first annual CFT or score in the top third of the first annual CFT, and 20.6 percent of men in the IST top third (but not 300) category score in the bottom third of the first annual CFT. Also, 10.9 percent of men that scored 300 or higher in the IST were in the bottom third of the first annual CFT. A similar pattern holds for women, as indicated by Table 12. For example, 18.2 percent (3.4 percent plus 14.8 percent) of women in the IST bottom third later score either 300 on the CFT taken at the end of recruit training or score in the top third (but not 300) of the CFT taken at the end of recruit training, and 22.8 percent of women in the IST top third (but not 300) group later score in the bottom third of the first annual CFT.

[30] We exclude most Marines who accessed in FY13 from this analysis since they have not yet had a chance to complete one year of service. Since we have a slightly different sample of Marines who took the first annual CFT than we had for the CFT taken at the end of recruit training, the cut-off points for the three categories of "IST thirds" are slightly different from the IST cut-off points taken at the end of recruit training. For men who took the first annual CFT, a Marine is classified as being in the bottom third of the IST if his IST score was 170 or less (IST ≤ 170); if his IST score was higher than 170 but lower than 214 (171 ≤ IST ≤ 213) he is classified as being in the middle third; and if his IST was greater than 213 but less than 300 (214 ≤ IST ≥ 299) he is classified as being in the top third of IST, but not 300. For women, these respective cut-off points are: IST ≤ 162 for the bottom third; 163 ≤ IST ≤ 208 for the middle third; and 209 ≤ IST ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for those who had an IST score of 300.

[31] For men, a Marine is classified as being in the bottom third of the first annual CFT if his CFT score was 279 or less (CFT ≤ 279); if his CFT score was higher than 279 but lower than 293 (280 ≤ CFT ≤ 292) he is classified as being in the middle third; and if his CFT was greater than 292 but less than 300 (293 ≤ CFT ≤ 299) he is classified as being in the top third of the CFT, but not 300. For women, these respective cut-off points are: CFT ≤ 277 for the bottom third; 278 ≤ CFT ≤ 291 for the middle third; and 292 ≤ CFT ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for Marines who had a first annual CFT score of 300.

Table 12. Relationship between DEP IST categories and first year CFT categories by gender, FY05-FY12 accessions

	Men					Women				
	Total recruits	CFT 300 (%)	CFT top third (but not 300) (%)	CFT middle third (%)	CFT bottom third (%)	Total recruits	CFT 300 (%)	CFT top third (but not 300) (%)	CFT middle third (%)	CFT bottom third (%)
IST 300	449	41.9%	27.8%	19.4%	10.9%	54	31.5%	29.6%	25.9%	13.0%
IST top third (but not 300)	39,730	20.7%	26.4%	32.3%	20.6%	3,087	17.1%	29.0%	31.1%	22.8%
IST middle third	40,521	10.8%	21.2%	35.8%	32.3%	3,071	7.7%	23.5%	35.9%	32.9%
IST bottom third	40,429	5.4%	14.1%	33.2%	47.3%	3,220	3.4%	14.8%	34.5%	47.4%
Total	121,129	12.4%	20.6%	33.7%	33.4%	9,432	9.4%	22.4%	33.8%	34.4%

Source: CNA Marine Corps personnel files

We investigate the relationship between DEP IST and the first annual CFT further with a tobit regression equation, where the dependent variable is the first annual CFT score that a Marine achieves after recruit training. The tobit regression allows us to formally test whether the IST categories shown in Table 12 are good predictors of the first annual CFT score, while controlling for other factors. These tobit regression results are shown in Table 24 of the appendix.

From Table 24, we see from both the coefficient estimate and the marginal change that men who score a 300 on the DEP IST later score, on average, 12.2 points higher on the first annual CFT than similar men who are in the IST top third (but not 300) category. Men in the IST middle third later have, on average, a first annual CFT score that is 6.7 points lower, and those in the DEP IST bottom third later have a score that is 12.5 points lower, than similar men who are in the IST top third (but not 300) category.

In Table 24, we see that the pattern for women is similar to that for men. Women who score 300 on the DEP IST later score, on average, 14.1 points higher on the first annual CFT than similar women in the IST top third (but not 300) category. Women

in the IST middle third later have, on average, a first annual CFT score that is 6.5 points lower, and those in the bottom third later have a first annual CFT score that is 13.0 points lower, than similar women in the IST top third (but not 300) category.

In summary, those who perform well on the DEP IST continue to perform well on the CFT after the first year of service.

Relationship between DEP IST score and second annual CFT score

The relationship between the DEP IST categories[32] and the second annual CFT score[33] is summarized in Table 13 below and in Table 25 in the appendix. Table 13 shows the relationship between DEP IST and CFT scores in the second year of a Marine's career. As with the relationship between the DEP IST and the CFTs taken at the end of recruit training and at the end of the first year of service, there continues to be a strong positive relationship between IST scores and CFT scores for both men and women. Men and women who do well on the DEP IST also tend to do well on the second annual CFT, and those who do poorly on the DEP IST also tend to do poorly on the second annual CFT.

[32] We exclude most Marines who accessed after FY11 from this analysis since they have not yet had a chance to complete two years of service. Since we have a slightly different sample of Marines who took the first annual CFT than we had for the CFTs taken at the end of recruit training or at the end of the first year of service, the cut-off points for the four categories of "IST thirds" are slightly different from those previously reported. For men who took the second annual CFT, a Marine is classified as being in the bottom third of IST if his IST score was 166 or less (IST ≤ 166); if his IST score was higher than 166 but lower than 210 (167 ≤ IST ≤ 209) he is classified as being in the middle third; and if his IST was greater than 209 but less than 300 (210 ≤ IST ≥ 299) he is classified as being in the top third of the IST, but not 300. For women, these respective cut-off points are: IST ≤ 157 for the bottom third; 158 ≤ IST ≤ 203 for the middle third; and 204 ≤ IST ≤ 299 for the top third, but not 300. For both male and female Marines, there is a fourth category for those who had an IST score of 300.

[33] For men, a Marine is classified as being in the bottom third of the second annual CFT if his CFT score was 279 or less (CFT ≤ 279); if his CFT score was higher than 279 but lower than 294 (280 ≤ CFT ≤ 293) he is classified as being in the middle third; and if his CFT was greater than 293 but less than 300 (294 ≤ CFT ≤ 299) he is classified as being in the top third of the CFT, but not 300. For women, these respective cut-off points are: CFT ≤ 277 for the bottom third; 278 ≤ CFT ≤ 291 for the middle third; and 292 ≤ CFT ≤ 299 for the top third, but not 300. For both men and women, there is a fourth category for Marines who had a second annual CFT score of 300.

Table 13. Relationship between DEP IST categories and second year CFT categories by gender, FY05-FY11 accessions

	Men					Women				
	Total recruits	CFT 300 (%)	CFT top third (but not 300) (%)	CFT middle third (%)	CFT bottom third (%)	Total recruits	CFT 300 (%)	CFT top third (but not 300) (%)	CFT middle third (%)	CFT bottom third (%)
IST 300	395	41.8%	23.8%	25.1%	9.4%	43	39.5%	20.9%	27.9%	11.6%
IST top third (but not 300)	37,666	22.8%	21.8%	35.0%	20.4%	2,707	18.5%	27.3%	30.7%	23.6%
IST middle third	38,065	12.5%	17.3%	38.1%	32.1%	2,761	9.0%	22.9%	35.0%	33.1%
IST bottom third	39,167	6.2%	11.2%	34.4%	48.2%	2,808	4.8%	14.9%	33.8%	46.5%
Total	115,293	13.8%	16.7%	35.8%	33.7%	8,319	10.8%	21.6%	33.2%	34.4%

Source: CNA Marine Corps personnel files

However, we also see from Table 13 that a significant number of men and women change categories between the DEP IST and the second annual CFT. For example, 17.4 percent (6.2 percent plus 11.2 percent) of men in the IST bottom third later either score 300 or score in the top third (but not 300) of the second annual CFT, and 20.4 percent of men in the IST top third (but not 300) group later score in the bottom third of the second annual CFT. Also, 9.4 percent of men that scored 300 or higher in the IST were in the bottom third of the second annual CFT A similar pattern holds for women, as shown in Table 13. For example, 19.7 percent (4.8 percent plus 14.9 percent) of women in the DEP IST bottom third later either score 300 or score in the top third (but not 300) of the second annual CFT, and 23.6 percent of women in the IST top third (but not 300) group later score in the bottom third of the second annual CFT. Also, 11.6 percent of women that scored 300 or higher in the IST were in the bottom third of the second annual CFT.

We further investigate the relationship between DEP IST and the second annual CFT by using a tobit regression equation, where the dependent variable is the second annual CFT score that a Marine achieves after recruit training. The tobit regression allows us to formally test whether the IST categories shown in Table 13 are good predictors of the second annual CFT score, while controlling for other factors. These tobit regression results are shown in Table 25 in the appendix.

From Table 25, we see that men who score 300 on the DEP IST later score, on average, 13.2 points higher on the second annual CFT than similar men who are in the IST top third (but not 300) category. Men in the IST middle third have, on average, a second annual PFT score that is 7.0 points lower, and men in the IST bottom third have a score that is 14.5 points lower, than similar men in the IST top third (but not 300) category.

In Table 25, we see that the pattern for women is similar to that for men. Women who score 300 on the DEP IST later score, on average, 15.9 points higher on the second annual CFT than similar women in the IST top third (but not 300) category. Women in the IST middle third later have, on average, a second annual CFT score that is 7.7 points lower, and women in the IST bottom third later have a score that is 15.9 points lower, than similar women in the IST top third (but not 300) category.

In summary, those who perform well on the DEP IST tend to perform well on the CFT after the second year of service.

Conclusions

We find that the DEP IST score is a good predictor of recruit training attrition, injury rates, and PFT and CFT scores: a higher DEP IST score appears to lead to both lower attrition and injury rates, and to higher PFT and CFT scores early in a Marine's career. The effect of IST scores on conditional 24-month and 45-month attrition was less pronounced than the effect of DEP IST scores on recruit training attrition, but our results still predict lower conditional 24- and 45-month attrition rates for both men and women who scored high on the DEP IST.

The relative effect of DEP IST scores on recruit training attrition is the same for men and women. Male recruits in the IST top third have a 4.7-percent attrition rate in recruit training, whereas those in the bottom third have a 10.9-percent attrition rate in recruit training. Female recruits in the IST top third have a 9.8-percent attrition rate in recruit training, whereas female recruits in the IST bottom third have a 20.2-percent attrition rate in recruit training. In short, attrition rates for both men and women in the IST bottom third are roughly twice those for men and women in the IST top third.

Based on a logit regression, the effect of the DEP IST on conditional 24-month and 45-month attrition rates is considerably smaller than similar logit regression estimates for recruit training attrition. Men in the IST bottom third have a 5.2.-percentage-point higher rate of attrition from recruit training than those in the IST top third. Women in the IST bottom third have a 9.6-percentage-point higher rate of attrition from recruit training than those in the IST top third. In terms of conditional 24-month attrition, men in the IST bottom third have a 1.0-percentage-point higher attrition rate than those in the IST top third. In that same category, women in the IST bottom third have a 2.3-percentage-point higher attrition rate than women in the IST top third.

When analyzing the relationship between DEP IST scores and the probability of being injured while in recruit training, we find that injury rates are lower for both men and women who have higher IST scores. We find that although the average recruit training injury rate for men is 3.6 percent, men in the IST top third have only a 2.5-percent predicted injury rate, men in the IST middle third have a 3.7-percent predicted injury rate, and men in the IST bottom third have a 4.7-percent predicted injury rate in recruit training.

We see a similar relationship between DEP IST scores and recruit training injury rates for women. Although the average injury rate for women is 6.0 percent, women in the IST top third have only a 4.7-percent predicted injury rate, women in the IST middle third have a 5.9-percent predicted injury rate, and women in the IST bottom third have a 7.7-percent predicted injury rate. We therefore conclude that higher DEP IST scores lead to lower predicted recruit training injury rates for both men and women.

Our analysis of the relationship between DEP IST scores and PFT and CFT scores taken during the early part of a Marine's career indicates that higher DEP IST scores lead to higher PFT and CFT scores. These effects are smaller for the CFT than for the PFT, and for the CFT the effects decline over the course of a Marine's first two years of service.

We caution that, although the DEP IST is a reliable predictor of PFT and CFT scores attained in the first two years of a Marine's initial enlistment, there is a significant percentage of recruits (13.2 percent of women for the PFT and 18.2 percent of women for the CFT) who score in the bottom third of the DEP IST and then score either 300 or in the top third on the PFT and CFT in recruit training. Similarly, there is a significant percentage of recruits (14.7 percent of women for the PFT and 35.8 percent for the CFT) who score either 300 or in the top third on the DEP IST and then score in the bottom third on the PFT and CFT in recruit training.

We recommend that the development of any policy to use DEP physical fitness indicators to support classification decisions include two provisions. First, recruits who were denied a physically demanding PEF because they attained a low DEP IST score should be eligible for the physically demanding PEF if they subsequently meet the physical fitness standard for that PEF at the end of recruit training. Second, recruits who were given a physically demanding PEF because they attained a high DEP IST score should be classified into a less physically demanding PEF if they fail to meet the physical fitness standard for the physically demanding PEF at the end of recruit training.

Appendix: Logit and Tobit Regression Results

Tables 14–26 present coefficient estimates of the logit and tobit regressions discussed in the main text.

Table 14. Recruit training attrition logit regression estimates by gender, FY05-FY13 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.336	0.364**	0.0204		0.334	0.391**	0.0407
		[17.17]				[7.46]	
IST bottom third	0.336	0.772**	0.0519		0.336	0.793**	0.0956
		[38.13]				[15.83]	
High quality	0.643	-0.239**	-0.0168		0.617	-0.179**	-0.0220
		[15.26]				[4.40]	
DEP months >=3	0.694	-0.123**	-0.0086		0.610	-0.149**	-0.0183
		[6.99]				[3.53]	
No enlistment waivers	0.504	-0.131**	-0.0090		0.511	-0.170**	-0.0207
		[8.32]				[4.28]	
Age at accession	19.354	0.031**	0.0022		19.282	-0.007	-0.0008
		[8.41]				[0.67]	
Enlistment bonus	0.176	-0.082**	-0.0055		0.214	-0.013	-0.0016

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
		[3.88]				[0.27]	
Accession trimester							
Oct-Jan accession	0.300	0.134**	0.0090		0.315	0.187**	0.0221
		[7.37]				[3.90]	
Feb-Apr accession	0.211	0.210**	0.0146		0.275	0.265**	0.0322
		[10.38]				[5.23]	
Racial/ethnic background							
Asian	0.033	-0.404**	-0.0238		0.040	-0.221*	-0.0258
		[8.30]				[2.12]	
Black	0.091	-0.02	-0.0014		0.152	-0.190**	-0.0224
		[0.76]				[3.39]	
Hispanic	0.176	-0.393**	-0.0242		0.235	-0.550**	-0.0603
		[17.37]				[10.50]	
Parris Island	0.484	0.121**	0.0083		N/A	N/A	N/A
		[7.84]				N/A	
Constant		-3.854**				-2.234**	
		[46.11]				[10.55]	
Number of observations		257,385				21,910	
Chi square (df = 23 & 22)		5,064.21				703.37	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 15. 24-month attrition logit regression estimates by gender, FY05-FY12 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.334	0.237**	0.0244		0.333	0.337**	0.0510
		[13.51]				[6.83]	
IST bottom third	0.359	0.503**	0.0575		0.353	0.661**	0.1097
		[29.70]				[13.90]	
High quality	0.629	-0.236**	-0.0277		0.609	-0.113**	-0.0190
		[17.46]				[2.89]	
DEP months >=3	0.665	-0.226**	-0.0267		0.585	-0.196**	-0.0330
		[15.06]				[4.81]	
No enlistment waivers	0.484	-0.165**	-0.0190		0.501	-0.211**	-0.0353
		[12.21]				[5.53]	
Age at accession	19.399	-0.005	-0.0005		19.293	-0.015	-0.0025
		[1.39]				[1.60]	
Enlistment bonus	0.200	-0.033+	-0.0037		0.241	-0.052	-0.0086
		[1.87]				[1.11]	
Accession trimester							
Oct-Jan accession	0.332	0.116**	0.0133		0.349	0.190**	0.0314
		[7.36]				[4.08]	
Feb-Apr accession	0.199	0.105**	0.0120		0.252	0.199**	0.0330
		[5.80]				[3.97]	
Racial/ethnic background							

	Men				Women		
	Mean	Coeff (z)	Derivative		Mean	Coeff (z)	Derivative
Asian	0.033	-0.387**	-0.0395		0.039	-0.373**	-0.0585
		[9.37]				[3.61]	
Black	0.088	-0.094**	-0.0106		0.152	-0.268**	-0.0433
		[4.02]				[4.93]	
Hispanic	0.170	-0.376**	-0.0397		0.223	-0.599**	-0.0914
		[19.51]				[11.90]	
Parris Island	0.481	0.119**	0.0137		N/A	N/A	N/A
		[8.91]				N/A	
Constant		-2.046**				-1.215**	
		[24.70]				[5.52]	
Number of observations		207,351				17,298	
Chi square (df = 22 & 21)		3,594.44				618.29	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: the regressions also controlled for accession FY and for observations missing race information.

Table 16. 45-month attrition logit regression estimates by gender, FY05-FY10 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.330	0.215**	0.0311		0.331	0.287**	0.0546
		[12.42]				[5.54]	
IST bottom third	0.395	0.479**	0.0751		0.379	0.568**	0.1143
		[28.93]				[11.40]	
High quality	0.606	-0.251**	-0.0404		0.595	-0.105*	-0.0213
		[19.24]				[2.55]	
DEP months >=3	0.601	-0.212**	-0.0341		0.539	-0.193**	-0.0392
		[14.85]				[4.57]	
No enlistment waivers	0.458	-0.232**	-0.0367		0.487	-0.208**	-0.0422
		[17.61]				[5.19]	
Age at accession	19.428	-0.016**	-0.0026		19.321	-0.017+	-0.0033
		[4.94]				[1.69]	
Enlistment bonus	0.228	-0.047**	-0.0073		0.285	-0.006	-0.0012
		[2.88]				[0.13]	
Accession trimester							
Oct-Jan accession	0.339	0.098**	0.0155		0.346	0.143**	0.0287
		[6.19]				[2.91]	
Feb-Apr accession	0.219	0.098**	0.0155		0.264	0.165**	0.0332
		[5.55]				[3.10]	
Racial/ethnic background							

	Men				Women		
	Mean	Coeff (z)	Derivative		Mean	Coeff (z)	Derivative
Asian	0.032	-0.386**	-0.0550		0.040	-0.422**	-0.0808
		[9.64]				[3.93]	
Black	0.086	0.027	0.0044		0.149	-0.296**	-0.0583
		[1.23]				[5.17]	
Hispanic	0.164	-0.357**	-0.0529		0.212	-0.645**	-0.1210
		[19.19]				[12.15]	
Parris Island	0.480	0.128**	0.0204		N/A	N/A	N/A
		[9.92]				N/A	
Constant		-1.052**				-0.565**	
		[14.06]				[2.66]	
Number of observations		159,613				12,925	
Chi square (df = 20 & 19)		3,141.71				436.37	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 17. 24-month conditional attrition logit regression estimates by gender, FY05-FY12 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.336	0.121**	0.0073		0.336	0.173*	0.0130
		[5.13]				[2.29]	
IST bottom third	0.345	0.165**	0.0101		0.330	0.304**	0.0234
		[6.96]				[4.06]	
High quality	0.635	-0.240**	-0.0153		0.617	-0.014	-0.0011
		[12.48]				[0.21]	
DEP months >=3	0.672	-0.326**	-0.0211		0.597	-0.290**	-0.0230
		[15.23]				[4.43]	
No enlistment waivers	0.490	-0.210**	-0.0130		0.512	-0.224**	-0.0174
		[10.91]				[3.65]	
Age at accession	19.371	-0.050**	-0.0030		19.275	-0.032*	-0.0024
		[9.53]				[2.04]	
Enlistment bonus	0.202	0.002	0.0002		0.241	-0.071	-0.0054
		[0.10]				[0.94]	
Accession trimester							
Oct-Jan accession	0.330	0.043+	0.0027		0.346	0.045	0.0035
		[1.91]				[0.61]	
Feb-Apr accession	0.195	-0.025	-0.0015		0.243	0.052	0.0040
		[0.95]				[0.64]	
Racial/ethnic background							

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
Asian	0.0337	-0.395**	-0.0213		0.039	-0.912**	-0.0544
		[6.66]				[4.30]	
Black	0.088	-0.151**	-0.0090		0.152	-0.507**	-0.0353
		[4.46]				[5.39]	
Hispanic	0.174	-0.348**	-0.0120		0.236	-0.611**	-0.0414
		[12.80]				[7.47]	
Parris Island	0.478	-0.011	-0.0007		N/A	N/A	N/A
		[0.58]				N/A	
Constant		-1.397**				-1.462**	
		[11.41]				[4.10]	
Number of observations		190,026				14,530	
Chi square (df = 22 & 21)		1,248.07				238.33	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 18. 45-month conditional attrition logit regression estimates by gender, FY05-FY10 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.332	0.140**	0.0081		0.334	0.054	0.0037
		[4.81]				[0.56]	
IST bottom third	0.378	0.315**	0.0197		0.349	0.103	0.0071
		[11.24]				[1.07]	
High quality	0.617	-0.226**	-0.0146		0.602	-0.119	-0.0084
		[10.06]				[1.46]	
DEP months >=3	0.615	-0.172**	-0.0110		0.558	-0.116	-0.0081
		[6.91]				[1.39]	
No enlistment waivers	0.470	-0.336**	-0.0209		0.507	-0.092	-0.0064
		[14.69]				[1.17]	
Age at accession	19.397	-0.055**	-0.0034		19.302	-0.021	-0.0014
		[8.97]				[1.07]	
Enlistment bonus	0.231	-0.059*	-0.0037		0.289	0.099	0.0070
		[2.16]				[1.12]	
Accession trimester							
Oct-Jan accession	0.335	-0.024	-0.0015		0.343	0.086	0.0059
		[0.85]				[0.88]	
Feb-Apr accession	0.215	0.038	0.0024		0.252	0.057	0.0039
		[1.24]				[0.54]	
Racial/ethnic background							

	Men				Women		
	Mean	Coeff (z)	Derivative		Mean	Coeff (z)	Derivative
Asian	0.033	-0.344**	-0.0187		0.042	-0.598*	-0.0350
		[4.90]				[2.55]	
Black	0.086	0.216**	0.0148		0.153	-0.385**	-0.0245
		[6.09]				[3.28]	
Hispanic	0.170	-0.256**	-0.0151		0.233	-0.669**	-0.0400
		[8.13]				[6.17]	
Parris Island	0.475	0.096**	0.0060		N/A	N/A	N/A
		[4.27]				N/A	
Constant		-1.138**				-1.723**	
		[8.44]				[4.11]	
Number of observations		134,880				9,676	
Chi square (df = 20 & 19)		1,074.35				101.98	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 19. Recruit training injury logit regression estimates by gender, FY05-FY13 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.354	0.426**	0.0124		0.337	0.237**	0.0117
		[9.52]				[2.91]	
IST bottom third	0.305	0.672**	0.0222		0.313	0.529**	0.0296
		[14.99]				[6.65]	
High quality	0.646	-0.083*	-0.0028		0.624	-0.088	-0.0049
		[2.30]				[1.31]	
DEP months >=3	0.708	-0.045	-0.0015		0.620	-0.102	-0.0057
		[1.08]				[1.47]	
No enlistment waivers	0.476	0.025	0.0008		0.519	-0.015	-0.0009
		[0.70]				[0.24]	
Age at accession	19.426	0.050**	0.0017		19.257	0.052**	0.0029
		[6.12]				[3.35]	
Enlistment bonus	0.169	-0.08	-0.0026		0.209	-0.043	-0.0024
		[1.48]				[0.48]	
Accession trimester							
Oct-Jan accession	0.285	-0.112**	-0.0035		0.307	0.008	0.0004
		[2.62]				[0.09]	
Feb-Apr accession	0.208	0.253**	0.0094		0.284	0.279**	0.0161
		[5.86]				[3.48]	
Racial/ethnic background							

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
Asian	0.022	0.067	0.0023		0.039	-0.201	-0.0104
		[0.61]				[1.16]	
Black	0.138	-0.003	-0.0001		0.151	-0.171+	-0.0090
		[0.06]				[1.82]	
Hispanic	0.119	-0.163**	-0.0053		0.242	-0.296**	-0.0154
		[2.93]				[3.69]	
Constant		-4.407**				-3.404**	
		[24.97]				[10.41]	
Number of observations		103,127				17,933	
Chi square (df = 22 & 22)		995.29				303.34	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 20. Recruit training PFT tobit regression estimates by gender, FY05-FY13 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST score of 300	0.003	27.203**	27.2033		0.005	23.781**	23.7814
		[28.26]				[7.42]	
IST middle third	0.338	-19.579**	-19.5789		0.334	-16.193**	-16.1926
		[147.17]				[30.16]	
IST bottom third	0.334	-38.318**	-38.3179		0.334	-33.812**	-33.8123
		[281.34]				[62.51]	
High quality	0.649	0.209+	0.2086		0.631	1.541**	1.5405
		[1.80]				[3.32]	
DEP months >=3	0.703	-3.642**	-3.6417		0.625	0.068	0.0677
		[27.67]				[0.14]	
No enlistment waivers	0.512	-0.703**	-0.7034		0.523	-0.327	-0.3268
		[6.31]				[0.73]	
Age at accession	19.322	0.372**	0.3723		19.248	0.493**	0.4931
		[12.48]				[4.30]	
Enlistment bonus	0.176	0.853**	0.8528		0.201	1.287*	1.2868
		[5.65]				[2.20]	
Accession trimester							
Oct-Jan accession	0.297	-0.858**	-0.8583		0.311	0.587	0.5867
		[6.59]				[1.10]	
Feb-Apr accession	0.208	1.338**	1.3379		0.274	0.581	0.5808

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
		[8.96]				[1.02]	
Racial/ethnic background							
Asian	0.034	2.795**	2.7950		0.040	-0.991	-0.9912
		[9.38]				[0.89]	
Black	0.090	8.499**	8.4986		0.150	2.850**	2.8500
		[0.36]				[2.17]	
Hispanic	0.182	4.542**	4.5420		0.249	2.108**	2.1078
		[44.16]				[4.53]	
Parris Island	0.479	-5.287**	-5.2871		N/A	N/A	N/A
		[47.62]				N/A	
Constant		268.891**				261.921**	
		[426.25]				[108.92]	
Number of observations		229,635				16,824	
Chi square (df = 24 & 23)		92,275.64				4,483.98	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 21. First year PFT tobit regression estimates by gender, FY05-FY12 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST score of 300	0.003	28.805**	28.8055		0.005	31.594**	31.5939
		[22.09]				[5.98]	
IST middle third	0.328	-20.584**	-20.5842		0.336	-20.937**	-20.9368
		[110.87]				[23.30]	
IST bottom third	0.340	-40.297**	-40.2970		0.335	-39.409**	-39.4086
		[213.97]				[43.39]	
High quality	0.646	0.311+	0.3107		0.624	1.102	1.1021
		[1.94]				[1.42]	
DEP months >=3	0.686	-4.923**	-4.9232		0.619	-1.485+	-1.4854
		[27.18]				[1.82]	
No enlistment waivers	0.502	0.21	0.2096		0.519	-0.793	-0.7929
		[1.35]				[1.06]	
Age at accession	19.313	0.009	0.0094		19.237	0.963**	0.9635
		[0.23]				[5.13]	
Enlistment bonus	0.191	1.885**	1.8847		0.227	1.850*	1.8499
		[9.27]				[1.96]	
Accession trimester							
Oct-Jan accession	0.236	3.784**	3.7845		0.235	4.653**	4.6526
		[19.46]				[4.89]	

	Men				Women		
	Mean	Coeff (z)	Derivative		Mean	Coeff (z)	Derivative
Feb-Apr accession	0.225	4.635**	4.6351		0.288	2.058*	2.0577
		[23.12]				[2.23]	
Racial/ethnic background							
Asian	0.035	3.693**	3.6934		0.042	4.843**	4.8430
		[9.01]				[2.65]	
Black	0.088	8.340**	8.3396		0.155	9.414**	9.4145
		[1.70]				[1.64]	
Hispanic	0.179	4.554**	4.5545		0.247	6.510**	6.5103
		[30.90]				[9.05]	
Parris Island	0.475	-2.985**	-2.9855		N/A	N/A	N/A
		[19.37]				N/A	
Constant		264.492**				238.529**	
		[261.81]				[51.05]	
Number of observations		179,287				13,034	
Chi square (df = 24 & 23)		49,299.2				2,240.34	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 22. Second year PFT tobit regression estimates by gender, FY05-FY11 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST score of 300	0.003	24.851**	24.8507		0.005	25.290**	25.2899
		[17.75]				[4.88]	
IST middle third	0.336	-19.405**	-19.4054		0.334	-18.857**	-18.8574
		[98.69]				[21.27]	
IST bottom third	0.337	-38.865**	-38.8647		0.334	-37.035**	-37.0348
		[193.42]				[41.39]	
High quality	0.644	0.570**	0.5697		0.622	0.739	0.7389
		[3.35]				[0.97]	
DEP months >=3	0.684	-5.274**	-5.2736		0.611	-3.021**	-3.0207
		[27.48]				[3.77]	
No enlistment waivers	0.498	0.982**	0.9817		0.521	-1.707*	-1.7070
		[5.98]				[2.32]	
Age at accession	19.363	-0.080+	-0.0800		19.262	0.579**	0.5790
		[1.86]				[3.15]	
Enlistment bonus	0.198	2.100**	2.1000		0.235	2.245*	2.2446
		[9.91]				[2.45]	
Accession trimester							
Oct-Jan accession	0.322	-0.01	-0.0098		0.335	-1.317	-1.3166

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
		[0.05]				[1.51]	
Feb-Apr accession	0.193	1.767**	1.7671		0.242	0.093	0.0931
		[7.78]				[0.10]	
Racial/ethnic background							
Asian	0.035	4.485**	4.4850		0.042	5.851**	5.8506
		[10.30]				[3.25]	
Black	0.088	6.803**	6.8034		0.157	5.440**	5.4402
		[0.53]				[0.26]	
Hispanic	0.178	4.806**	4.8064		0.250	7.177**	7.1766
		[23.68]				[5.32]	
Parris Island	0.475	-3.717**	-3.7174		N/A	N/A	N/A
		[22.74]				N/A	
Constant		278.626**				260.288**	
		[175.43]				[40.44]	
Number of observations		171,055				12,357	
Chi square (df = 24 & 23)		41,236.9				2,013.07	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 23. Recruit training CFT tobit regression estimates by gender, FY05-FY13 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST score of 300	0.004	8.906**	8.9061		0.005	7.809**	7.8086
		[11.92]				[2.95]	
IST middle third	0.334	-4.999**	-4.9990		0.334	-5.792**	-5.7922
		[46.41]				[13.59]	
IST bottom third	0.335	-10.294**	-10.2940		0.333	-11.031**	-11.0307
		[96.22]				[25.76]	
High quality	0.700	0.177+	0.1769		0.654	-0.018	-0.0176
		[1.84]				[0.05]	
DEP months >=3	0.852	-1.024**	-1.0241		0.679	-0.26	-0.2596
		[8.25]				[0.65]	
No enlistment waivers	0.577	-0.529**	-0.5286		0.548	0.382	0.3821
		[5.91]				[1.08]	
Age at accession	19.235	0.277**	0.2773		19.238	0.346**	0.3464
		[11.19]				[3.73]	
Enlistment bonus	0.110	0.08	0.0803		0.131	-0.208	-0.2079
		[0.57]				[0.40]	
Accession trimester							
Oct-Jan accession	0.271	-2.157**	-2.1570		0.297	-0.816+	-0.8165

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
		[20.15]				[1.86]	
Feb-Apr accession	0.177	-0.789**	-0.7886		0.264	-2.235**	-2.2349
		[6.44]				[4.89]	
Racial/ethnic background							
Asian	0.036	-3.666**	-3.6658		0.041	-2.842**	-2.8415
		[15.47]				[3.24]	
Black	0.097	-0.901**	-0.9014		0.157	-2.810**	-2.8099
		[5.16]				[1.37]	
Hispanic	0.197	-1.409**	-1.4095		0.269	-2.450**	-2.4505
		[5.97]				[5.71]	
Parris Island	0.489	0.192*	0.1916		N/A	N/A	N/A
		[2.15]				N/A	
Constant		288.332**				281.326**	
		[559.91]				[146.98]	
Number of observations		107,425				9,287	
Chi square (df = 21 & 19)		27,365.95				1,115.17	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 24. First year CFT tobit regression estimates by gender, FY05-FY12 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST score of 300	0.004	12.246**	12.2462		0.006	14.085**	14.0853
		[7.20]				[3.01]	
IST middle third	0.335	-6.719**	-6.7189		0.326	-6.516**	-6.5157
		[28.31]				[7.84]	
IST bottom third	0.334	-12.500**	-12.5000		0.341	-13.015**	-13.0151
		[52.09]				[15.76]	
High quality	0.675	2.210**	2.2102		0.643	1.428*	1.4276
		[10.59]				[2.01]	
DEP months >=3	0.780	0.369	0.3686		0.649	-0.866	-0.8660
		[1.47]				[1.14]	
No enlistment waivers	0.554	0.008	0.0083		0.555	-0.725	-0.7251
		[0.04]				[1.06]	
Age at accession	19.340	0.395**	0.3947		19.317	0.108	0.1076
		[7.44]				[0.62]	
Enlistment bonus	0.175	0.396	0.3957		0.194	1.432	1.4323
		[1.51]				[1.60]	
Accession trimester							
Oct-Jan accession	0.305	-7.604**	-7.6041		0.335	-6.108**	-6.1075

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
		[31.61]				[7.16]	
Feb-Apr accession	0.199	-4.342**	-4.3422		0.254	-3.584**	-3.5835
		[16.12]				[3.98]	
Racial/ethnic background							
Asian	0.036	-0.663	-0.6628		0.042	0.588	0.5881
		[1.29]				[0.35]	
Black	0.096	1.727**	1.7266		0.161	1.575+	1.5748
		[1.27]				[0.78]	
Hispanic	0.188	0.795**	0.7947		0.264	1.414+	1.4143
		[5.17]				[1.67]	
Parris Island	0.487	-2.597**	-2.5970				
		[13.14]					
Constant		293.708**				291.858**	
		[247.08]				[76.15]	
Number of observations		121,128				9,432	
Chi square (df = 20 & 19)		21,837.3				1656.84	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 25. Second year CFT tobit regression estimates by gender, FY05-FY11 accessions

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST score of 300	0.003	13.162**	13.1617		0.005	15.863*	15.8631
		[6.45]				[2.50]	
IST middle third	0.330	-6.976**	-6.9762		0.332	-7.717**	-7.7174
		[25.21]				[7.34]	
IST bottom third	0.340	-14.537**	-14.5365		0.338	-15.893**	-15.8933
		[52.06]				[15.08]	
High quality	0.650	1.908**	1.9083		0.630	1.501+	1.5006
		[8.01]				[1.67]	
DEP months >=3	0.714	-0.285	-0.2846		0.614	-0.422	-0.4220
		[1.02]				[0.44]	
No enlistment waivers	0.529	0.758**	0.7576		0.550	-0.452	-0.4524
		[3.31]				[0.52]	
Age at accession	19.385	0.301**	0.3008		19.312	-0.119	-0.1192
		[5.00]				[0.55]	
Enlistment bonus	0.253	0.305	0.3047		0.281	1.344	1.3442
		[1.13]				[1.32]	

	Men				Women		
	Mean	Coeff (z)	Derivative		Mean	Coeff (z)	Derivative
Accession trimester							
Oct-Jan accession	0.306	-6.499**	-6.4985		0.328	-7.165**	-7.1649
		[23.09]				[6.59]	
Feb-Apr accession	0.197	-0.14	-0.1402		0.242	-0.957	-0.9570
		[0.45]				[0.83]	
Racial/ethnic background							
Asian	0.035	-0.003	-0.0035		0.043	4.306*	4.3064
		[0.01]				[2.04]	
Black	0.093	1.765**	1.7651		0.164	2.758*	2.7578
		[1.23]				[1.12]	
Hispanic	0.182	1.809**	1.8093		0.260	4.158**	4.1579
		[4.49]				[2.32]	
Parris Island	0.481	-3.565**	-3.5646		N/A	N/A	N/A
		[15.60]				N/A	
Constant		290.456**				291.226**	
		[19.85]				[10.70]	
Number of observations		115,292				8,319	
Chi square (df = 21 & 19)		20,233.6				1538.89	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

Table 26. DEP attrition logit regression estimates by gender, FY05-FY13 contracts[a]

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
IST middle third	0.334	0.331**	0.0252		0.333	0.266**	0.0270
		[19.57]				[5.48]	
IST bottom third	0.339	0.862**	0.0788		0.335	0.903**	0.1093
		[53.32]				[19.78]	
High quality	0.645	0.197**	0.0175		0.618	0.275**	0.0318
		[14.64]				[7.18]	
No enlistment waivers	0.240	-0.005	-0.0005		0.226	-0.131**	-0.0150
		[0.33]				[2.88]	
Enlistment bonus	0.159	-7.252**	-0.1326		0.179	-7.094**	-0.1960
		[16.21]				[7.09]	
Racial/ethnic background							
Asian	0.034	-0.112**	-0.0098		0.039	-0.280**	-0.0308
		[3.17]				[2.78]	
Black	0.092	-0.010	-0.0009		0.155	-0.015	-0.0017
		[0.46]				[0.29]	
Hispanic	0.180	-0.002	-0.0002		0.238	-0.228**	-0.0260

	Men				Women		
	Mean	Coeff	Derivative		Mean	Coeff	Derivative
		(z)				(z)	
		[0.10]				[5.14]	
Constant		3.752**				4.715**	
		[42.36]				[17.99]	
Number of observations		281,923				25,905	
Chi square (df = 20 & 20)		28,248.3				3,967.6	

Absolute value of z statistics in brackets: + significant at 10%; * significant at 5%; ** significant at 1%. Note: These regressions also controlled for accession FY and for observations missing race information.

[a.] From Table 26 we see that men in the middle third of the IST score have a DEP attrition rate that is 2.5 percentage points higher than similar men in the top third of the IST score; and men in the bottom third of the IST score have a DEP attrition rate that is 7.9 percentage points higher than similar men in the top third of the IST score. For women, these respective differences in attrition rates are 2.7 percentage points higher for women in the middle third of the IST score relative to similar women in the top third of the IST score; and 10.9 percentage points higher for women in the bottom third of the IST score relative to similar women in the top third of the IST score. We had to exclude 48 percent of the DEP attrites in this analysis since they did not have an IST score. This may bias the estimates shown in Table 26.

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