

Quantity and Quality of Attrition

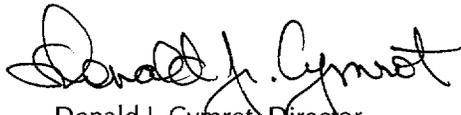
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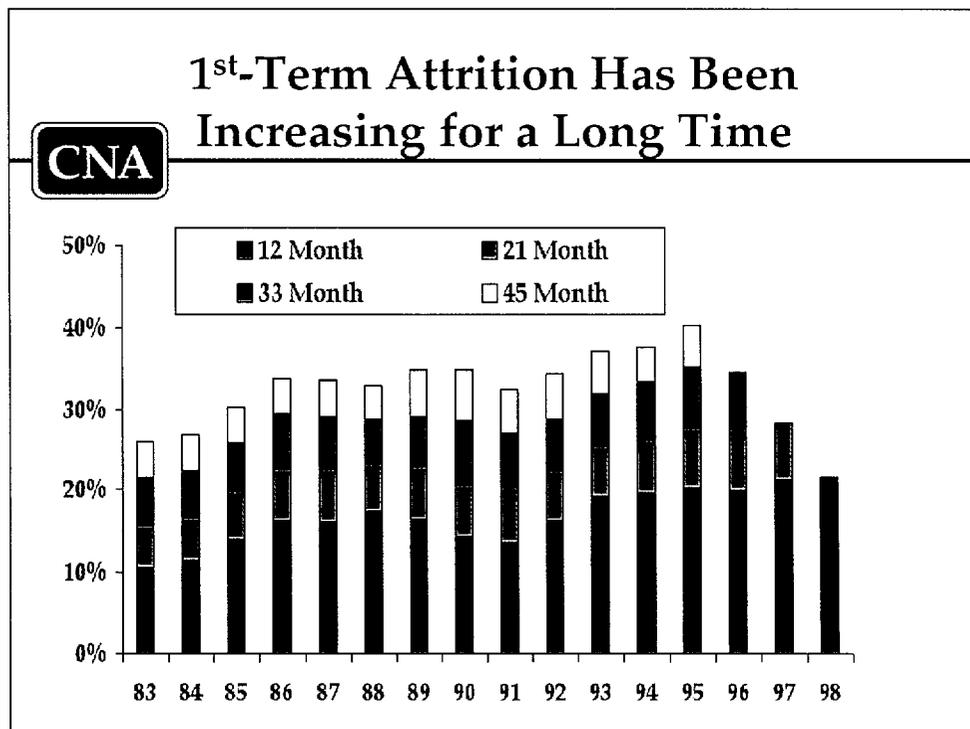
Quantity and Quality of Attrition

Donald J. Cymrot

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June 2000

This briefing was presented to the Navy Human Resources Board of Directors Meeting on June 28, 2000. It contains a synthesis of a series of CNA studies from the last several years.



Recently, the Navy has focused much attention on trends in attrition through the 1990s. However, a longer term perspective is important.

This slide shows the Navy's first-term attrition rate going back to FY 83. The data are organized by entry cohort. Each bar in the graph follows all recruits who entered the Navy in a particular year with 4 or more years of initial obligation. Different colored segments of each bar represent a point in time in the career. We use 45 months as the end of the first term because some sailors are permitted to leave the Navy up to 3 months before the end of their initial obligation "for the convenience of the government."

The most recent cohort to complete its first term of service is the group that entered in FY 95. We include bars for the entry cohort of FY 96 through FY 98 to show their progress to date. Thus, our data actually follow sailors through the end of FY 99.

Important findings from this graph are as follows:

- Attrition has been increasing steadily for at least 15 years.
- Various efforts over time have met with some-short term success before the upward trend resumed.
- First-term attrition among the most recent cohorts now tops 40 percent; that is, four of ten recruits do not even complete their initial obligation.
- The attrition rate of the cohorts currently in their first term appears likely to remain at the historically high levels.

An Overview of Attrition

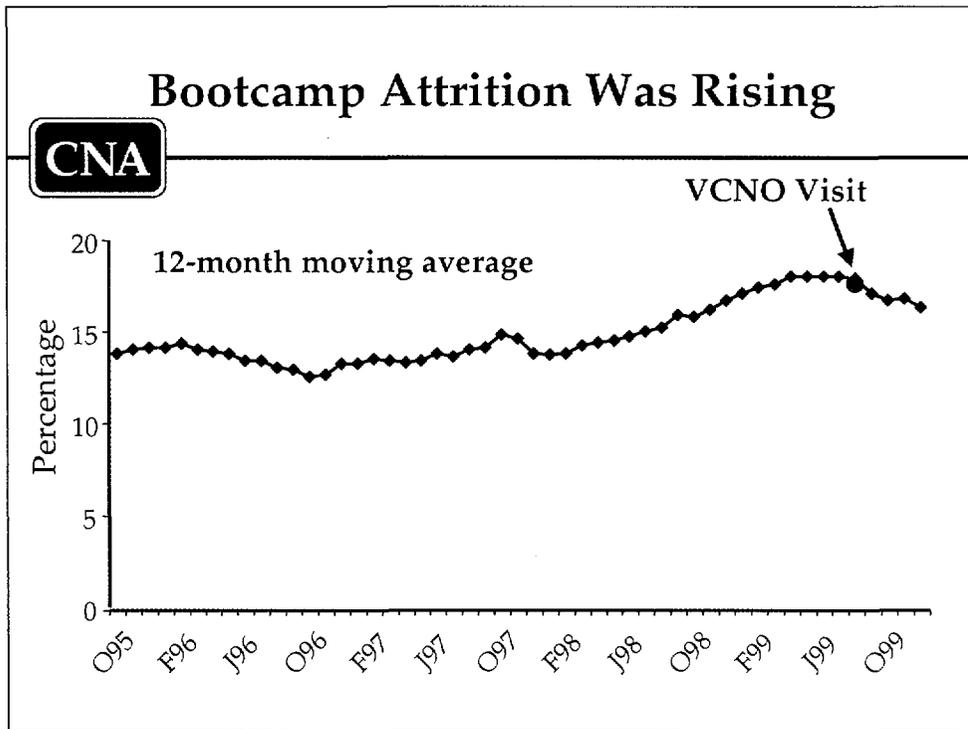
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- First-term attrition is on the rise in all phases (i.e., bootcamp, schoolhouse training, fleet)
- Management attention to the problem can be helpful
- New trend toward more losses among high-quality sailors

The next part of the briefing examines the aggregate data in greater detail. First, we look at the different segments of the first term: bootcamp, initial skills training after bootcamp, and fleet assignments. We show that the increase in attrition is not the result of a problem in one segment of the first term; attrition appears to be on the rise in all phases of the first term and for a variety of reasons.

Our investigation suggests that one factor that can help reduce attrition is the involvement of the senior leadership. When the senior leadership highlights the difficulties of high attrition, lower levels of management take action that results in lower attrition. We present evidence of the salutary effects of senior leadership attention on attrition.

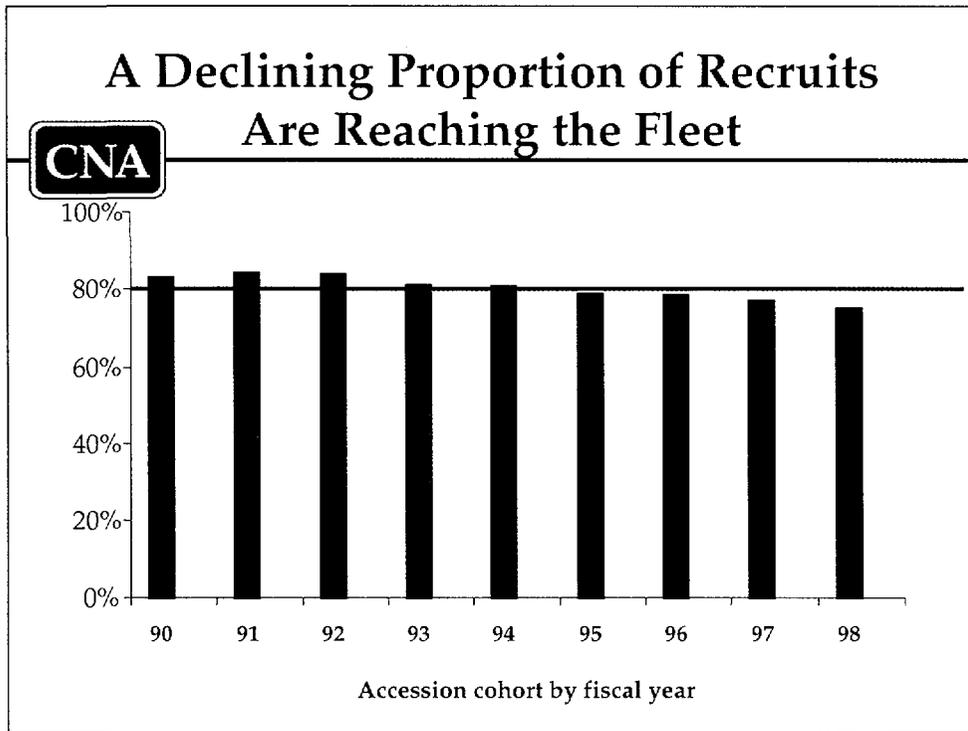
We then look at changes in the attrition rate by quality category. While investigating the increase in attrition, we found that perhaps the most disturbing aspect is that the increase is disproportionately large among the Navy's potentially best sailors.



This slide shows the 12-month moving average for attrition from bootcamp starting in the beginning of FY 96. We use the 12-month moving average because this measure smoothes much of the month-to-month volatility in the attrition numbers. The 12-month moving average measures the attrition over the previous year. For example, the attrition rate for January 1999 captures the attrition behavior from the beginning of February 1998 through the end of January 1999. The rate for February 1999 will use the same monthly data as the January 1999 with the exception that it will replace February 1998 with February 1999.

This particular measure drew our attention to the attrition rate increase beginning in early FY 98. By mid FY 99, we became alarmed that the rate might actually exceed 20 percent by the end of the year. We briefed our finding to the Navy leadership up to Admiral Pilling (Vice Chief of Naval Operations).

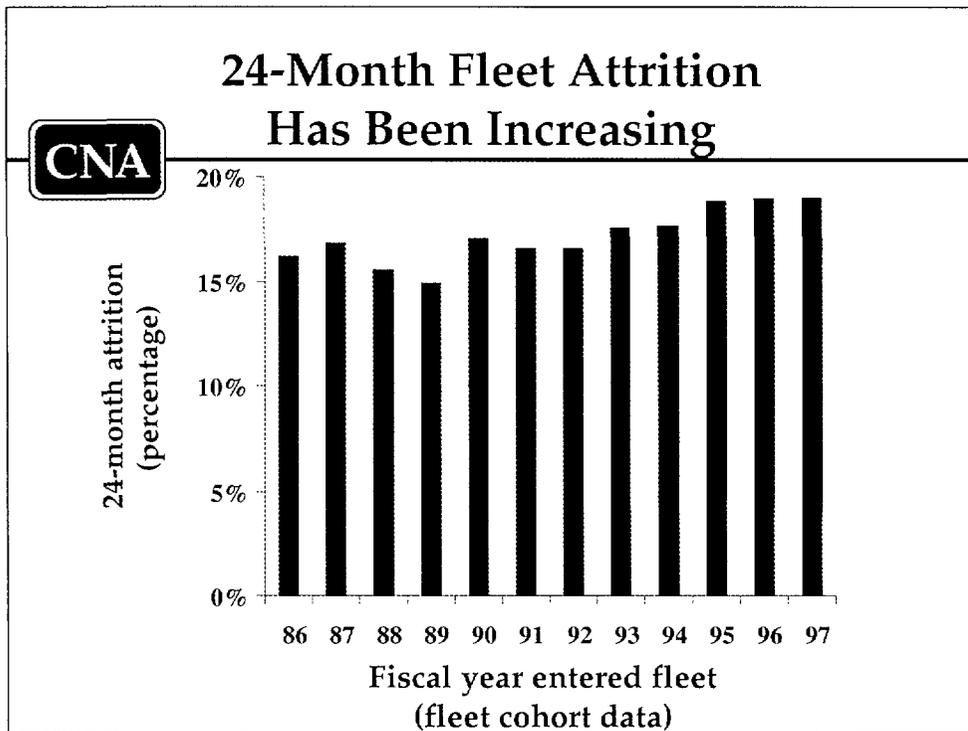
During the summer of 1999, the VCNO scheduled a trip to the Recruit Training Center at Great Lakes to better understand the dynamics of the attrition. As the VCNO's visit approached, bootcamp attrition began to level out. By the month after the visit, the monthly attrition rate had fallen to around 11.3 percent (a drop of more than 5 percentage points in less than 2 months). Although the leadership at bootcamp clearly deserves much credit for this decrease, it seems more than mere coincidence that the precipitous drop occurred around the time of the visit.



This graph shows the attrition from a slightly different perspective—by measuring the efficiency of the training system. Again tracking accession cohorts, we follow recruits through both bootcamp and initial skills training to entry into the fleet. The fleet here means any non-training assignment. For example, in this metric, a hospital corpsman’s initial assignment to the Bethesda Naval Hospital represents a fleet assignment.

Note that recruits do not provide meaningful productivity to the Navy when they are in these training assignments. It is only after the recruit reaches a fleet assignment that the Navy starts to realize a return on its recruiting and training investment. The purpose of this graph is show, at least by one metric, how the return on the Navy’s investment in recruiting and training has changed over the decade.

The percentage of recruits reaching the fleet has been falling in recent years. In the early 1990s, the Navy lost about 17 or 18 percent of its recruits before the fleet assignment milestone. For the most recent cohorts, the attrition is around 23 percent. The graph actually provides the best case scenario for the latest cohorts. Some members of these entry cohorts are still in training; thus, they could not possibly have reached the fleet yet. The graph is drawn assuming that all those still in training will eventually reach a fleet assignment. If some of these in-training recruits fail to reach the fleet, an updated version of the graph will show an even larger drop in the percentage entering the fleet.



This graph is a natural follow-on to the previous graph because it tracks cohorts from the beginning of the first fleet assignment. Thus, we are counting only those recruits who successfully completed their initial skill training and have now entered the fleet. It then tracks these sailors for the first 24 months of their initial fleet assignment. Because we are tracking cohorts, the most recent cohort to complete the 24-month threshold entered the fleet sometime in FY 97.

This graph shows the upward trend in attrition. In the late 1980s, the attrition rate hovered around 15 percent, but in recent years it had moved up to 18 or 19 percent.

Implications of High Attrition

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- 40% attrition for most recent cohort
- Suppose attrition dropped to 30%
 - Annual recruiting mission reduced by 6,500 to 7,000 at a savings of \$65M to \$70M
 - Higher fleet readiness
 - More senior crew
 - Smaller proportion of strength in IA

So, attrition has reached 40 percent—what’s the big deal? The problem is that attrition imposes a significant cost on both the operational and support elements of the Navy.

In this slide, we show some of these costs. For example, suppose the Navy is able to reduce its first-term attrition rate from 40 percent to 30 percent. Also suppose that these reductions resulted from a series of initiatives that reduced the rate roughly proportionately over the first term. We estimate a reduction in the recruiting mission of about 12 percent. With a steady-state recruiting mission of about 57,000, this decline translates to about 6,500 to 7,000 fewer recruits. Under current conditions, the average recruit costs around \$10,000. In the long run, the saving would be on the order of \$65 million to \$70 million.

Furthermore, a reduction in attrition would have other benefits. Because the Navy would not have to be constantly training new recruits, a smaller proportion of the total strength would be in individuals account (IA). As a result, readiness would increase for two reasons. Fleet manning would increase, and the average sailor in the fleet would have a greater level of experience. CNA’s readiness work shows that increases in both the quantity and quality of fleet manning improve readiness.

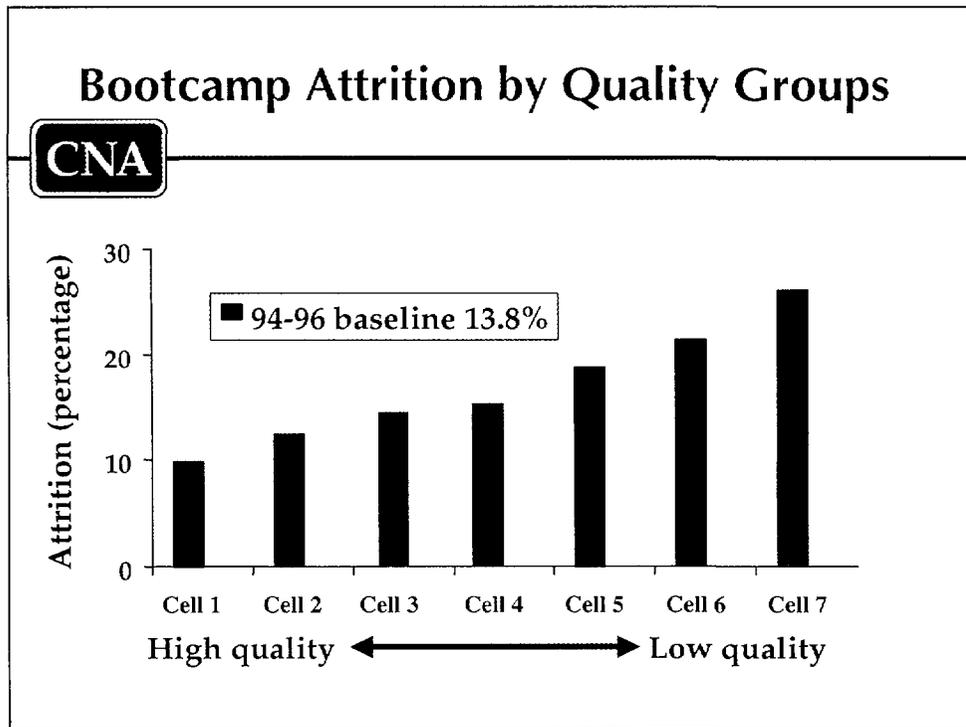
The Quality Story

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- Measures of quality – expensive to recruit; largest training investments
 - Upper mental group, HS graduates with time in the Delayed Entry Program
 - Long training pipelines
- Attrition gap between quality and other sailors is narrowing

In addition to the quantity of attrition, this briefing considers the quality of attrition. In this case, the term *quality* refers to the level of investment the Navy makes in people. Quality falls into two overlapping categories: those personnel who are the most expensive to recruit and those who spend the longest times in training. Navy Recruiting Command (CNRC) estimates that it makes the largest investment in recruits who have regular high school diplomas scoring in the upper half of the Armed Forces Qualification Test (AFQT) and spend time in the Delayed Entry Program (DEP).

Traditionally, recruits in the highest quality group have the lowest attrition rates. Over time, however, the attrition gap between these high-quality recruits and all other recruits has been narrowing. The quality recruits still have an advantage—just not as much as in the past. We will once again examine three components of the first term: bootcamp, initial skills training, and fleet.

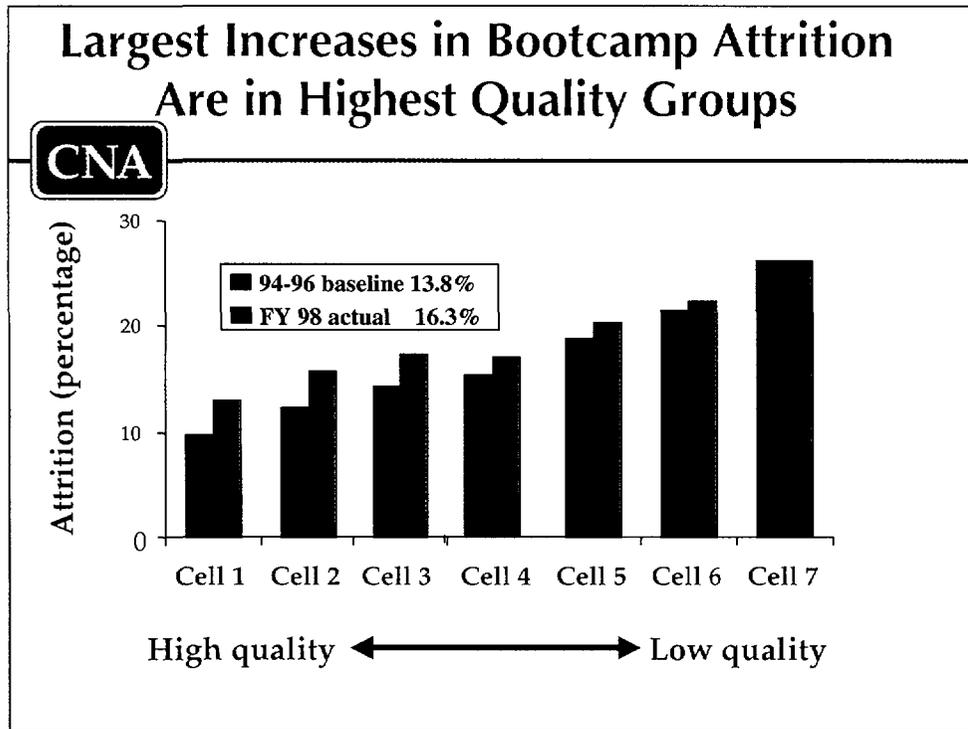


On this slide, we show the bootcamp attrition rates, by quality cell, for the baseline period of FY 94 to FY 96. Unlike much of the analysis in this briefing, which was done using aggregate data obtained from CNET, this analysis is done on individual data, SSN by SSN. We have divided the entry cohort into seven quality categories. The definitions of the quality categories follow:

- Quality cell 1: AFQT category I-II, high school diploma graduate (HSDG), Delayed Entry Program (DEP)
- Quality cell 2: AFQT category IIIA, HSDG, DEP
- Quality cell 3: AFQT category I-IIIA, HSDG, direct ship (DS)
- Quality cell 4: AFQT category IIIB, HSDG, DEP
- Quality cell 5: AFQT category IIIB, HSDG, DS
- Quality cell 6: all AFQT categories, non-HSDG, DEP
- Quality cell 7 : all AFQT categories, non-HSDG, DS*

On average, attrition was 13.8 percent over the baseline period, but the attrition within cells increases as we move away from the smart graduates in the DEP.

* HSDG corresponds to DOD Tier I classification; non -HSDG corresponds to DOD Tiers II and III classifications.



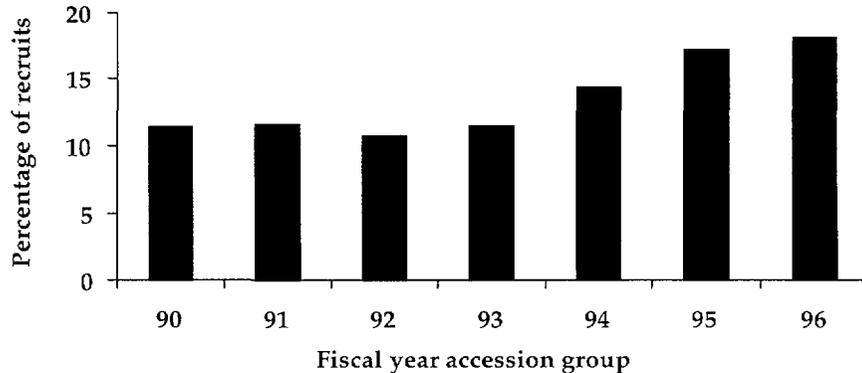
On this slide, we add the bootcamp attrition rates for the FY98 accessions.

For FY 98 accessions, the overall attrition rates increased to about 17 percent. As the previous slide showed, most Navy accessions are in quality cells 1-3 (high school diploma graduates with some DEP and varying AFQT scores). For FY98, about three quarters of recruits came from quality cells 1-3 (Cell 1 (30.3 percent), Cell 2 (18.2 percent), Cell 3 (25.7 percent)).

We have over 20 years of data to show that cell 1 recruits have the lowest bootcamp and fleet attrition of any of the quality groups. In this recent increase in bootcamp attrition, however, it is the attrition rate for this “best group” that has risen the most sharply. In contrast, the attrition rates for the lowest quality cells (quality cell 6 and 7) have barely changed. Quality cell 1 recruits are high school diploma graduates (or better) with DEP and with AFQT scores greater than the 65th percentile. For the base period, their bootcamp attrition rate was 9.8 percent. For the FY 98 accessions in this quality group, the bootcamp attrition rate was 13.0 percent.

Increasing School Attrition Among 6YOs

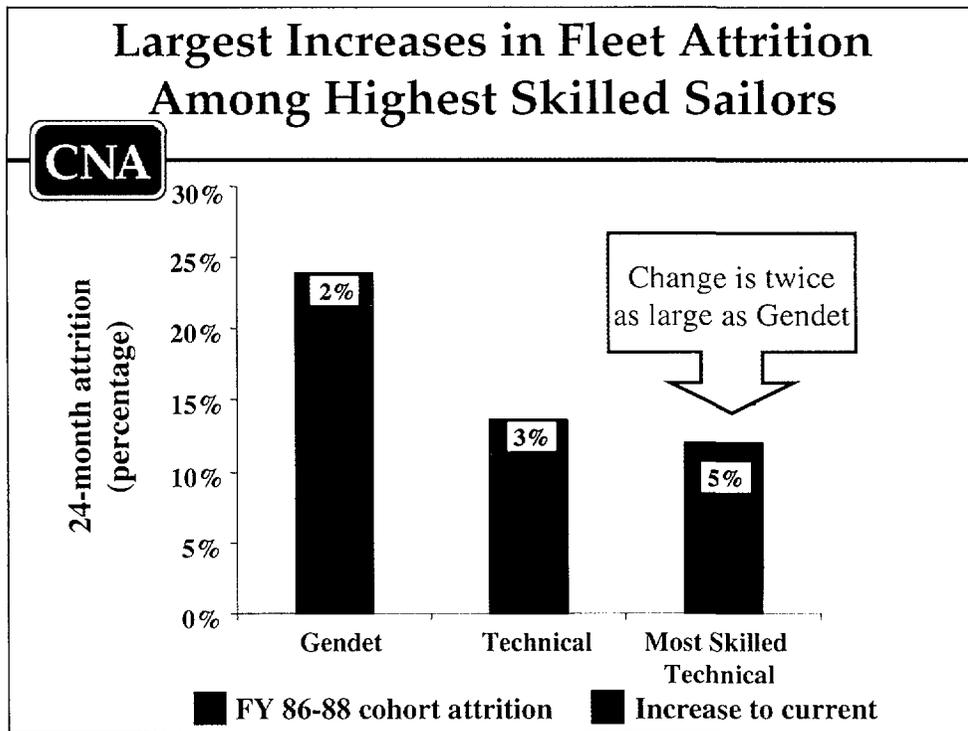
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This chart shows the percentage of 6YO recruits who left the Navy before reaching the fleet. This percentage increased substantially during the 1990s, rising from 17 percent for FY 90 recruits to 27 percent for FY 96 recruits. Nearly all this increase occurred between FY 92 and FY 95.

Unlike 4YOs, most 6YOs left after bootcamp. In addition, most of the increase in total attrition was the result of the increase in after-bootcamp attrition—although bootcamp attrition did increase from 6 to 10 percent.

We found this trend disturbing because 6YOs are generally among the best and the brightest recruits. Yet over a quarter of the 6YO recruits in FY 95-96 never reached the fleet. Although these rates compare favorably to attrition rates for the recruits with shorter obligations (at the 2-year point), the Navy invests less in the training of these other recruits and, on average, they probably have less potential. Because of the high pre-fleet attrition rate for 6YO, the Navy may want to rethink its strategy of offering so much up-front training to these recruits.



This graph compares fleet attrition rates among three groups: General Detail (Gendets), Technical, and Most Skilled Technical. Gendets receive only a few weeks of apprenticeship training after bootcamp. The Technical group includes ratings with such descriptors as technician, electrician, mechanic, utilities and engineering, as well as both medical ratings. The Most Skilled Technical is a select subset of the Technical ratings. The group includes such ratings as aviation and electronics technicians. They are ratings with some of the longest training pipelines, and they afford some of the best civilian sector job opportunities.

The blue (lower) parts of the bar show the fleet attrition rates among these three groups from the baseline years 1986 to 1988. As expected, the attrition rates are correlated to the amount that the Navy invests in the sailors in each category. So, Gendets, the least trained, have about three times the attrition rate as those sailors in the Most Skilled Technical category.

The red (upper) parts of the bars show the increase in fleet attrition rates between the baseline years and the last year of the data (FY 98). Again, it is not surprising given the increase in the aggregate trend that the attrition rate is up in each category. What is troublesome, however, is that the increase among the most technically skilled sailors is more than twice that of the Gendets.

Reasons for Attrition Increases

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- Continuing drawdown mentality
- Sustained good economy
 - Some new evidence that attrition is correlated to state unemployment rate in home of record
- Weakened sanction effect of less than honorable discharges
 - Pressed civilian employers willing to overlook military record

This slide considers the causes of the increase shown in the previous section.

During the drawdown, the Navy was relatively rich in people. In general, strength was brought down at a slower rate than the fleet. It was easier to decommission ships than to reduce strength. Thus, it is not surprising that the standards for behavior may have increased. Many people talk about the “zero defect mentality” that arose during this period.

A second factor in the attrition increase may have been the strength of the economy. The unemployment rate has been trending downward for most of the last 15+ years. A strong economy means that the risk of losing a Navy job is reduced because jobs in the civilian economy are plentiful. In the past, it has been difficult to find good statistical evidence of the relationship between lower unemployment and attrition in either the Navy or the civilian economy. Historical studies of the civilian economy do not find that job turnover rates depend strongly on the economy.*

Recent work at CNA does provide some evidence that some of the increase in attrition might be attributed to the strength of the economy. Related to this argument is the reduced effect of “less than honorable” discharges on the future employment opportunities for Navy attrites. There are at least three explanations for this reduced sanction effect. First, in our litigious society, fewer people are willing to give critical recommendations about former employees. As a result, employers are relying less on past employment histories to make hiring decisions. Second, in the face of labor shortages, employers might be willing to overlook more bad marks on a prospective employee’s record. Third, with the declining veteran population, fewer employers are familiar with the military discharge system so that a general discharge, for instance, might not seem different from an honorable discharge.

* *Journal of Labor Economics*, October 1999, Vol. 17, No. 4, Part 2.

Tight Labor Market and Attrition

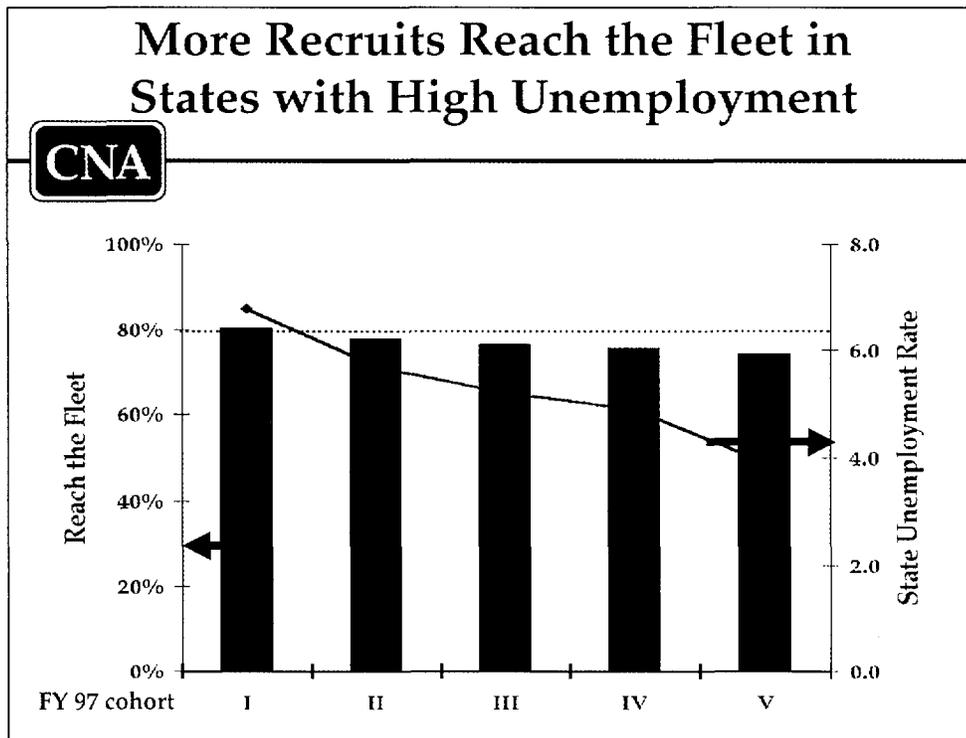
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Tight labor market can affect attrition in two ways:

- Stronger economic incentives to attrite
 - Higher wages and a shorter job search make civilian employment more attractive.
- Changes in the characteristics of recruits
 - More recruits come from groups that are the least able to benefit from a strong labor market. *This can have positive or negative effects on attrition.*

The role that the civilian labor market can play in the Navy attrition rate is a fairly straightforward one. As the civilian economy improves, active duty Navy personnel may see the civilian economy as a lure.

The effect of an improving economy on the predicted attrition rate is theoretically ambiguous. As the economy improves, those workers with the best civilian opportunities may become increasingly difficult to attract into the Navy. So the mix of recruits may change. The change in the recruiting mix could increase or decrease the predicted attrition. For example, minority groups have lower attrition rates than the majority white population. If the improving economy increases minority representation among the newer recruit cohorts, other things equal, the predicted attrition rate would decline.



In an ongoing study, CNA has looked at the difference in attrition rates across recruits from different states. The thought behind this analysis is that relatively new recruits are most likely to return to their home town if they attrite from the Navy. This chart breaks recruits into five state groups based on the unemployment rate in that state in 1997. Group I on the chart represents those states with the highest average unemployment rate (about 7 percent). Each successive group (II through V) has lower unemployment rates. The red line shows the decline in the employment rate. We then tracked the recruits through bootcamp and initial skill training. The blue bars represent the percentage of recruits from a particular grouping of states who make it to the fleet. In 1997, slightly over 80 percent of recruits from the states with the highest unemployment rates remained in the Navy through their initial training phase. In contrast, only about 74 percent of recruits from states with the lowest unemployment rate made it through training and to the fleet.

We have analyzed each year from FY 94 to FY 98 and found similar results. One important finding across these years, however, is that the differential in the percentage of recruits completing initial training between the high- and low-unemployment states gets larger as the overall U.S. employment rate falls. This finding suggests the possibility of some nonlinearity in the effect of unemployment on attrition. Specifically, very low unemployment may be imposing an increasing cost (in terms of attrition) on the Navy.

This finding broadens our understanding of the effect of a strong economy on the cost of people to the Navy. In the past, it has been generally understood that a strong civilian economy will increase the cost of attracting and retaining people at the reenlistment point. This finding suggests that the retention battle is not episodic but rather continuous.

Programs To Reduce High-Risk Attrition

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- High Performance Profile Predictor (HP3)
 - New screening tool to improve the “quality” of non-HSDGs
 - Replaced Compensatory Screening Model (CSM) in mid FY 99
- Academic Capacity Enhancement (ACE)
 - 1-week course to improve Navy performance of dropouts
 - Available only in off-peak load months

Recently CNA has been asked to undertake evaluations of two Navy initiatives to deal with high-risk recruits: the High Performance Profile Predictor (HP3) and the Academic Capacity Enhancement (ACE) course. HP3 is a device designed to improve the screening of non-HSDGs as Navy recruits. The previous tool for screening non-HSDGs was the Compensatory Screening Model (CSM). In both cases, researchers had identified easily verifiable characteristics, such as age or years of education, that improved the probability that a recruit would successfully transform into a productive sailor. HP3 replaced CSM in February 1999.

ACE is a 1-week course provided at the very beginning of bootcamp for non-HSDGs. The course offers recruits the opportunity to take the General Equivalency Diploma (GED) test and also offers counseling on behavioral issues, such as anger management. Because of the capacity limits at bootcamp, ACE is not offered at all times but only during the off-peak shipping months.

Ongoing Program Assessments

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- HP3 screens about as well as CSM but waivers seem to undermine the system
 - ACE course does not appear to reduce attrition among either dropouts or GEDs
-
- Confounding factors in the analysis
 - Across-the-board declines in attrition
 - Near simultaneous implementation
 - Questions about the reliability of the data

Although both of our assessments are ongoing, the early results suggest that neither program is making a significant dent in the recruiting problems.

Our analysis, however, is continuing because of several mitigating factors with these initial conclusions. First, attrition among high-risk recruits at bootcamp is actually down in recent months. The problem is that attrition among low-risk recruits is also down. Second, the HP3 and ACE programs were implemented within a few months of each other. To the extent that there are some improvements in the high-risk category, it would be difficult to separate the individual effect of each.

Finally, there seems to be some question about the accuracy of the Navy training data (from NITRAS). The first area of concern is an inconsistency between the recruiting data (from the Pride system) and the training data (from NITRAS). A second concern is the inconsistency between information provided directly from bootcamp and from the official databases. Although the first problem is a serious concern, we have run our results using both and Pride and NITRAS data and reach essentially the same conclusion with each. We continue to work with bootcamp to resolve any further inconsistencies.



Ideas to Explore: Maintaining Accountability

- Integrate NTC & CNRC organizations
- Attrition reports by command
- FitReps for officers and senior enlisted
- Imposing costs on local commands
- Identifying “Best Practices”

One of the purposes of this briefing is to raise the awareness level of the attrition problem among the Navy’s senior leadership. We recognize, however, that even if we succeed in energizing the leadership on the issue in the short run, other issues are likely to draw their attention over time. Therefore, we concentrated on how the Navy can change its system so that the attrition issue is raised in importance at lower levels in the command structure, even when the senior leadership is focused on other issues.

We have organized our suggestions/recommendations into two categories. The first, shown here, includes ideas aimed at improving accountability within the system. The second, shown on the next slide, deals with incentives.

Our first thought is to integrate the Naval Training Center (Great Lakes) and Commander, Navy Recruiting Command (CNRC) into the same organization. This model, which is currently in use in the Marine Corps, has the advantage of unifying the leadership responsible for delivering trained recruits to the fleet. Under the current system, NTC tends to focus most of its attention on delivering quality to the fleet. Although concern about the final product of their efforts is surely appropriate, it tends to make the NTC risk averse about individual recruits. If a recruit fails, it becomes someone else’s responsibility to find a replacement. By integrating NTC with CNRC, the same leader faces the consequence of failing to provide adequate quality and quantity of recruits to the fleet.

The second and third suggestions on this list are related; both involve raising attrition concerns on a much more regular basis at the local levels. If the best and worst commands for attrition are tracked, local commanders will be more likely to worry about attrition on a regular basis. Of course, such reports need to be viewed carefully because not all commands face an equal challenge in combating attrition. For example, commands with a higher percentage of high school dropouts are likely to have a higher attrition rate because they are staffed with a riskier population.

The fourth bullet broadens the concept of attention a little further than the previous two. If commands are forced to pay for attriting a sailor, they will be more likely to work with potential attrites to solve problems. Commands already pay some costs because in many cases they are not provided with immediate replacements. Perhaps during the downsizing replacement happened faster because more people were in the system. As manning problems have arisen, billets are more likely to be gapped for longer periods of time. Thus, there exists a cost. Another possibility is to impose some type of financial penalty. The problem with this approach, particularly for frontline units, is that short-term readiness may be of paramount importance so that senior leadership would not want to undermine readiness by imposing fines.

The final bullet simply suggests identifying some ideas from outside the Navy or even outside the government, and then determining whether they are applicable to the circumstances of the Navy.

Ideas to Explore: Incentives

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- Financial
 - Rephasing bootcamp pay
 - Completion pay
 - BAH for singles?
- Quality of work life
 - Formal voice in the PPBS process
 - Voluntary education time
 - Minimizing working out of rating
 - Internet connectivity

We have divided our incentive ideas into two categories: financial and quality of work life (in contrast to the traditional quality-of-life programs). Our first suggestion is to reconfigure the pay of new recruits to provide a reward for completion of bootcamp. Because recruits have little opportunity to spend money during bootcamp, the pay for the first 8 weeks of bootcamp could be reduced to a minimal level. Then the difference between the current pay and this new minimal pay level could be shifted to a one-time “bonus” for completion of bootcamp. Such a system would reduce the total payments to attrites.

The second subbullet expands on this idea to other places in the career. The only completion pay that we are aware of currently in use in the Navy is the enlistment bonus. A recruit receives an enlistment bonus only upon completion of initial skill training. CNA is undertaking a study to determine whether these incentives actually reduce attrition both in initial skill training and in the fleet. If the results of this study are promising, perhaps such incentives could be expanded.

There is one caveat for this approach. We usually argue that a dollar received today has a greater effect on behavior than one deferred into the future. Thus, selective reenlistment bonuses are frontloaded. A dollar of completion pay is likely to have less of an effect on reenlistment or immediate action, but a greater effect on the long-term behavior. A more complete analysis of the costs and benefits of this approach would be useful.

Finally, over the last few years, single E-5s on sea duty were given the basic allowance for housing. This expansion of the entitlement was intended to increase the quality of life for sailors with the aim of reducing attrition and improving retention. Now that the Navy has a few years of experience with the new program, this would be a good time to evaluate it.

Our second set of suggestions deals with issues of the quality of work life. Given the work schedule of most sailors, they spend far more time at work or in a working environment (i.e., on a ship) than in any other activity. Improving the environment at work might be one way to improve morale and reduce attrition. One fundamental problem is that no one has overall responsibility for quality of work life in the Navy. So, in the PPBS process, no one does an overall assessment of the quality-of-work-life program. As a result, the Navy may be systematically under-investing in this area. Improving the visibility within the PPBS system may be one way to address this investment issue.

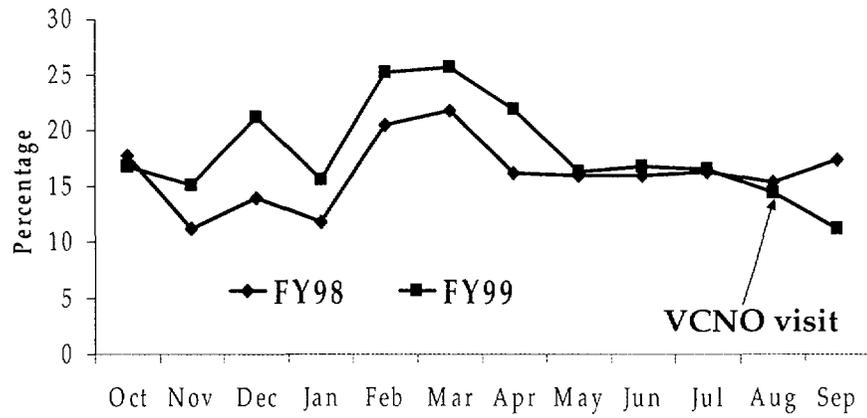
The other subbullets under quality of work life represent three different ingredients of overall work life. First, time for voluntary education represents actions taken by local command that would help foster a more positive environment. Many sailors would like to participate in voluntary education, but they are constrained by the lack of command support. Second, minimizing working out of rate represents systemic issues in the management of the personnel system. When newly trained sailors are forced to work in the mess or the laundry, it can be demoralizing and thus encourage attrition. Higher manning of the Gendet rating would reduce the need for the technically trained sailors to work in these out-of-rating positions. Third, internet connectivity represents those types of investments that improve both the living and working environment on ships. A greater sensitivity to these three areas of quality of work life could be one of the ways to reduce attrition.

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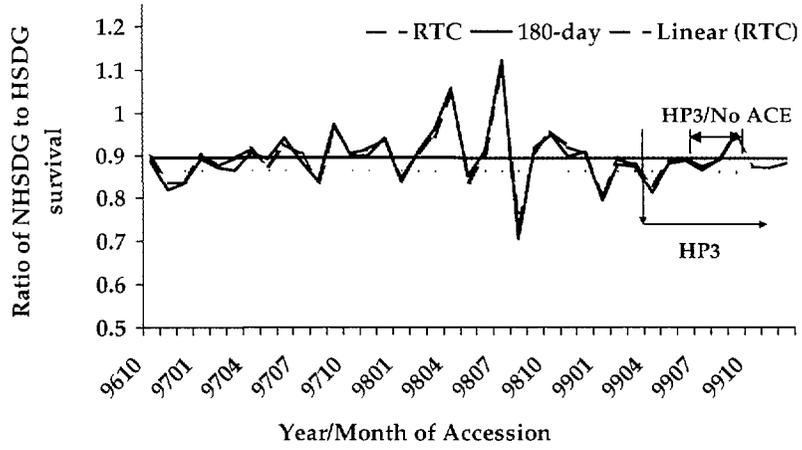


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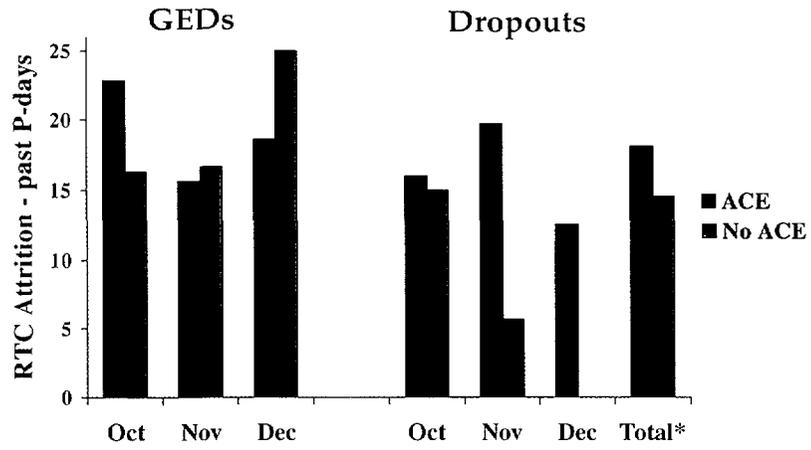
Monthly Bootcamp Attrition Rates



HP3/ACE Have Not Changed the Long-term Trend



Attrition Comparison for ACE



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