MCRD Attrition and Comparisons with the Navy

Aline O. Quester
MCRD Attrition
and
Comparisons with the Navy

Dr. Aline Quester
CNA Scientific Analyst for DC/S, M&RA
July 1999
Bootcamp Attrition Rates Over the Last Year:
June 1998 through May 1999

• Navy bootcamp attrition rates
  – 18.0 percent
    • 23.3 percent for females
    • 16.7 percent for males

• Marine Corps bootcamp attrition rates
  – 13.4 percent
    • 20.4 percent for females
    • 12.9 percent for males

Sources: Navy (CNET); Marine Corps (Marine Corps Recruiting Command).
Regular NPS accessions.

In this briefing, we look at bootcamp attrition in the Navy and the Marine Corps. Here we compare attrition over the last 12 months (June 1998 through May 1999). Recent bootcamp attrition in the Navy has been considerably higher than in past. The rates for both females and males have risen sharply. The Navy bootcamp attrition rates for females are extraordinary. From 1979 to 1997, bootcamp attrition rates for males and females were very similar, with some years having slightly higher rates for males and some years having slightly higher rates for females. In FY98, the female attrition rate began to rise sharply. In contrast, Marine Corps bootcamp attrition is well within the historical averages of 11 to 15 percent for males and 20 to 25 percent for females.

Note: All the information in this briefing is available in Excel files. I would be pleased to provide them to anyone who could use them.
Next we turn to historical data. The past-year data on the previous slide were drawn from aggregate counts reported by the bootcamps, whereas the historical data are drawn from CNA's SSN-based accession files.
Here we show cohort bootcamp attrition patterns for accession years FY90 through FY98.

For these analyses, we use CNA's accession cohort files.* To allow for attrition for recruits who are set back or recycled in their training, we tabulate all separations during the first 12 months of service from the Marine Corps Recruit Depots (MCRDs).** These cohort-based analyses yield very similar results to analyses using aggregate fiscal year data from the bootcamps. The analyses are not identical, however, because they are looking at slightly different populations. The cohort analyses depicted here are by fiscal year of accession. We follow all recruits who entered in a particular fiscal year, tabulating the bootcamp attrition (including that which occurs in the next fiscal year). In contrast, aggregate fiscal year data look at the attrition within the fiscal year; some of that attrition comes from recruits who entered in the prior fiscal year.

*The Marine Corps data from FY90-91 are from GRANDRAM, and the data from FY92-98 are from ARMS. These accession cohort files are SSN based.

**We use the monitored command code (MCC) at separation for the Marine recruits.
This slide is also restricted to regular male bootcamp attrition, but it shows attrition rates by recruit depot. While the male bootcamp attrition at the two depots was quite different in FY98, we’ve had such differences before. For the 1990s, FY91 showed the largest differences in rates between the two depots. It is also worth noting that male regular attrition is not always highest at MCRD, Parris Island (PI). In FY94 and FY95, MCRD, San Diego (SD) had regular male attrition rates that exceeded those at Parris Island.
In most years of the 1990s, female bootcamp attrition has been between 20 and 25 percent. Because more of the female than the male attrition appears to occur later in bootcamp, we divided the bars depicting female bootcamp attrition into two parts: attrition during the first 3 months (dark gray) and attrition after 3 months (light gray).

*This is a rough cut because we did not have the full date field on the file. The attrition for the first 3 months is found by subtracting the accession date (year/month) from the separation date (year/month). Thus, if a recruit entered late in the month (say, 30 July) and left early in the month (say, 2 October), our methodology would say the recruit left after the first 3 months (October, the 10th month, minus July, the 7th month). This is not correct.

We intend to add the days field to the file for the separation and accession date. Then we will be able to exactly tabulate the portion of bootcamp attrition that occurs after the regular period of bootcamp.
Year-to-Date (YTD)
Through May 1999

Now we turn to analysis of year-to-date information.
By displaying year-to-date comparisons of the same period over several years, one can get a good feel for how we are doing relative to the same period in previous years. It is important to use the same periods because seasonality in accession phasing causes fairly systematic differences in attrition rates for different periods in the year. One also needs a reasonable period of months before year-to-date calculations are meaningful. Single monthly attrition rates are virtually always misleading because the phasing of attrition is different from the phasing of accessions.*

Both male and female attrition are down in FY99 from the levels they were (through May) in FY98.

*The depots calculate monthly attrition rates as attrites in the month divided by accessions in the month. Because accessions are phased unevenly over the year and became most bootcamp attrites occur in the month after the accession month, this method yields distorted results. For example, with the MCRD method, June always has low attrition. In June the accessions are large (big denominator), but the attrites come from May accessions (a small accession month creating a small attrition numerator).
Here we look at the October to May bootcamp attrition for males at the two depots. Attrition is down at both depots, most sharply at Parris Island.
Predictions for Marine Corps Bootcamp Attrition in FY99: Regulars

(Predictions use historical relationship between first half and full fiscal year)

Here we will turn to predictions for bootcamp attrition in FY99.
As we have stated, displaying year-to-date comparisons of the same period over several years is an effective way to show how we are doing relative to the same period in previous years. It is important to use the same periods because seasonality in accession phasing causes fairly systematic differences in attrition rates for different periods in the year.* When the year-to-date results are lined up next to the results for the full year, we can see the historical relationships between the two rates. The light bars show attrition rates for the first half of the year (October through March), and the dark bars show the rates for the full fiscal year for male and female regular accessions.

As the slide shows, the full-year bootcamp attrition rate has been lower than the attrition for the first 6 months of the year. In the summer, we get the lower attrition recruits who have just graduated from high school and have been in the DEP.

Over the years of these data, bootcamp attrition for the full year averaged 86 percent of the rate for the first 6 months of the year. Last year, the full-year rate was 83 percent of the half-year rate. Thus, if this year follows historical patterns, FY99 bootcamp attrition will be 12.6 percent. If it follows last year’s pattern, it will be 12.2 percent.

* One also needs a reasonable period of months before year-to-date calculations are meaningful.
This slide differs from the previous slide by showing only male regular accessions. Using the historical relationship between the first half of the FY and the full FY allows us to make a prediction for bootcamp attrition.
Here we restrict the analysis to female regular accessions. As the slide shows, the relationship between bootcamp attrition in the first half of the FY and the full FY has been pretty erratic. Averaging the information for FY96 through FY98 (increases for the full year in FY96 and FY97 and decreases for the full year for FY98) is probably not very meaningful. We show the “prediction,” but we aren’t very confident about it.
Predictions for Navy Bootcamp
Attrition in FY99

(Predictions use historical relationship between first half and full fiscal year)

Here we turn to what is going on in the Navy.
The slide shows the relationship between half-year (October to March) and full-fiscal year bootcamp attrition for Navy recruits. If this year follows historical patterns, FY99 bootcamp attrition will be 18.6 percent. If it follows last year’s pattern, it will be 19.6 percent.
Comparisons:
Navy and Marine Corps
Bootcamp Attrition

(Recent rates, historical rates,
and FY99 predictions)
Since FY98 the Navy has reported bootcamp attrition information primarily as a 12-month moving average. In the past, we have been quite critical of this measure because we believe that a 12-month moving average provides little information about what is happening in the current month. Events in the previous 11 months tend to overwhelm what happened in the current 11 months. We have also argued that moving averages barely change from month to month, even if attrition patterns are changing.

However, moving averages are very good for picking up long-term trends. When attrition rates are rising, a 12-month moving average will rise. Indeed, the 12-month moving average for the Navy has been rising since January 1998. In January 1998, bootcamp attrition had averaged 13.7 percent for the last 12 months. By May 1999, the average for the past 12 months was 18.0 percent. In the Marine Corps, the 12-month moving average for bootcamp attrition has been falling since August 1998. As of May 1999, the average was substantially below the Navy’s (13.4 versus 18.0).

A 12-month moving average, by definition, already has all 12 months of information. Thus, unlike many of the other measures of bootcamp attrition, it is not affected by seasonality. It will fall in July 1999 only if the attrition in July 1999 (the month that is added to the average) is less than the attrition in July 1998 (the month that will be dropped from the average).
Here we show the information for female recruits in the Navy and Marine Corps. Again we restrict the analysis to regulars. Female bootcamp attrition in the Navy is way up. Currently, female bootcamp attrition in the Navy is higher than in the Marine Corps.

While female recruit attrition in the Marine Corps is well within its historical bounds of 20 to 25 percent, female attrition in the Navy is considerably outside the historical bounds of 11 to 15 percent. From 1979 through 1997, male and female bootcamp attrition rates in the Navy were virtually identical. Since 1998, however, female attrition has increased substantially. As of May 1999, bootcamp attrition (measured by the 12-month moving average) was 23.3 percent for female Navy recruits and 16.7 percent for male Navy recruits.
Navy and Marine Corps Male Bootcamp Attrition Rates: 12-Month Moving Average

Source: Navy data (CNET monthly attrition reports); Marine Corps data (MCRC Monthly Briefings) for October 1996 through May 1999. Includes all male regular accessions. (Including MC reservists would reduce MC bootcamp attrition percentages.)

Here we show the 12-month moving average for bootcamp attrition rates for male regular Marines and male Navy recruits. The rates were fairly similar in FY97 and FY98. Currently, however, the Marine Corps male bootcamp attrition rate is substantially below the Navy’s (12.9 versus 16.7 percent). While the Marine Corps rate is well within historical bounds, the Navy rate is substantially above the historical average.
This slide shows the historical bootcamp attrition rates for the FY90 through FY98 accession cohorts. Navy bootcamp attrition rates since 1992 have been surprisingly similar to Marine Corps bootcamp attrition rates. Since Marine Corps bootcamp is 4 weeks longer than Navy bootcamp and considerably more demanding, it is a tribute to the Marine Corps process of "making Marines."

Projections for FY99 merely highlight the current problems of the Navy with bootcamp attrition.
Male Bootcamp Attrition: Marine Corps and Navy

Source: CNA accession cohort files for FY90-98; FY99 projections made from analysis of bootcamp attrition data from MCRC and CNET (using historical relationship between first half of fiscal year and full fiscal year).

On this slide, we restrict the comparisons to male recruits in both services.
Female bootcamp attrition rates in the Marines Corps have historically been considerably higher than Navy rates. Without any changes in training that we have been able to uncover, Navy female recruit attrition began to rise sharply in FY98. We project even higher rates for FY99.
Here we look at Marine Corps bootcamp attrition for regulars and reserves. Because the Navy has no similar program for reserves, there are no comparisons with the Navy.

*The Navy does have accession programs that mix active duty commitments and reserve commitments. The largest program involves an active-duty commitment of 3 years and a commitment of 3 years in the Selected Reserve.
Here we show male bootcamp attrition at the two depots for the October-May period. The attrition rate at both depots fell in FY99 from the FY98 levels. The drop in attrition at Parris Island was particularly sharp.
For reasons that we do not entirely understand, the Marine Corps bootcamp attrition rates for reserves are usually lower than those for Marine Corps regulars. This result is long-standing, and it holds even when we control for differences in accession quality.
On this slide, we show the bootcamp attrition 12-month moving average for female accessions into the regulars and the reserves.

In this period, the Marine Corps accessed about 2,500 regular and about 280 reserve female accessions in each 12-month interval. Thus each point on the two line graphs represents either the attrition rate for about 2,500 regular female accessions or 280 reserve female accessions. These are big enough denominators to evaluate.

Since FY98, the bootcamp attrition for female reservists has been substantially lower than that for female regulars. This finding probably merits additional investigation.*

---

*We have regularly monitored and kept historical records for regular Marine Corps accessions. Our information on Marine Corps accessions in the Reserve force has been much less complete. We can look at the attrition behavior of female regular and female reserve accessions since FY92, however, with our new accession file. We also think that these recent differences in attrition behavior might make an interesting Naval Postgraduate School thesis topic.
Male Attrition:
MCRD, PI and MCRD, SD

To conclude this look at bootcamp attrition, we turn to the depots and our predictions for FY99 full-year bootcamp attrition rates.
MCRD, San Diego: Half-Year and Full-Year Male Bootcamp Attrition Rates

Here we show year-to-date (October through March) and full-year attrition for MCRD, San Diego. Using the average relationship between attrition rates for the first 6 months of the year and attrition rates for the full year, we predict that the male attrition rate at MCRD, San Diego will be slightly under 10 percent for the year. Using last year’s relationship only, we predict a full-year male attrition rate of 10 percent.

All data are from MCRC reports and include regulars and reserves. The attrition rate is calculated as attrites in the period divided by the accessions in the period.
MCRD, Parris Island: Half-Year and Full-Year Male Bootcamp Attrition Rates

Here we show year-to-date (October through March) and full-year attrition for MCRD, Parris Island. Using the average relationship between attrition rates for the first 6 months of the year and attrition rates for the full year, we predict that the male attrition rate at MCRD, Parris Island will be 13.7 percent for the year. Using last year's relationship only, we predict a full-year male attrition rate of 12.9 percent.*

*Note that there was a much larger drop for full-year attrition (from the rate for the first 6 months) in FY98 than in other years.
Distribution list

Annotated Briefing 99-90

SNDL
A6 HQMC
  Attn: MP
  Attn: MPP
  Attn: MPP (EPS)
  Attn: M&RA (SGT MAJ)
  Attn: DC/S, M&RA
  Attn: ADC/S, M&RA

V8 CG MARCORCRUITCOM
  Attn: CG MCRC
  Attn: MCRC SGT MAJ
  Attn: MCRC, C/S
  Attn: MCRC, RE (UNIT HEAD)
  Attn: MCRC, RE (OPS CHIEF)
  Attn: MCRC, RP (UNIT HEAD)
  Attn: MCRC (R)