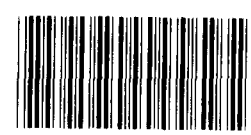
BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Secretary Of The Navy

High-Quality Senior Marine Corps Officers: How Many Stay Beyond 20 Years Of Service?

Are the best-qualified senior officers staying in the armed services to become the military managers of the future? Or are they electing to retire under the 20-year voluntary retirement provision before they get to that stage in their careers? GAO provides empirical data that contradict anecdoctal reports claiming that the higher-quality officers leave at the end of 20 years.

Using an indicator of quality that combined performance ratings and job experience, GAO found that, in general, the best-qualified male unrestricted officers in the U.S. Marine Corps stayed in the service for consideration by the 1979-81 selection boards for promotion to colonel. Education was related to quality and retention: Officers with advanced education tended to be rated higher in quality and to remain in the Marine Corps longer.



GAO/PEMD-85-1
NOVEMBER 13, 1984

Request for copies of GAO reports should be sent to:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are $3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are $1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

PROGRAM EVALUATION
AND
METHODOLOGY DIVISION

B-215474

The Honorable John F. Lehman, Jr.
The Secretary of the Navy

Dear Mr. Secretary:

This report documents what we found in attempting to answer a question frequently raised by officials in the Department of Defense: Are the best-qualified officers leaving the military at 20 years of service, or are they staying long enough for selection to the ranks of senior military management? This report provides empirical data that contradict anecdotal reports claiming that the higher-quality officers leave at the end of 20 years.

Our study was closely coordinated with the Manpower Plans and Policy Division and the Personnel Management Division of Headquarters, U.S. Marine Corps. A draft of the report was reviewed by the Department of the Navy. The substantive material in the report was presented as a formal briefing to Mr. William H. Lindahl, Acting Deputy Assistant Secretary of the Navy (Manpower), on May 9, 1984. It was also presented to Brigadier General J. M. Mead, Director, Manpower Plans and Policy Division, Headquarters, U.S. Marine Corps, on May 8, 1984. Copies of the report are being sent to them and will be made available to others who are interested.

Sincerely,

Eleanor Chelimsky
Director

GENERAL ACCOUNTING OFFICE
REPORT TO THE
SECRETARY OF THE NAVY

RETENTION OF HIGHER-QUALITY SENIOR MARINE CORPS OFFICERS: HOW MANY STAY BEYOND 20 YEARS OF SERVICE?

D I G E S T

A number of major policy discussions in recent years have centered on the military retirement system. Most of them have concentrated on the specific implications of changing it. One such concern is about how the distribution of personnel by age and experience might change if the system were different. Another is about the economic cost to officers who elect to retire at the end of 20 years of service and to those who remain.

Few studies have looked at the question of whether the "best-qualified" personnel are retained. GAO performed an empirical and comparative study that focused on the quality of U.S. Marine Corps lieutenant colonels who retired at the end of 20 years of service and those who remained for consideration for promotion by a colonel selection board. The analysis was limited to officers who were or would have been considered by the 1979-81 colonel selection boards.

GAO addressed two basic questions:

--Did the "best-qualified" lieutenant colonels leave before being considered for promotion to colonel?

--Were quality and retention differentiated by
professional education,
academic education,
military occupational specialty,
years of military service, or
temporal proximity to a colonel selection board?

WHO WERE THE OFFICERS?

GAO surveyed the Army, Air Force, and Navy for the availability of data, its degree of automation and completeness, and ease of sampling and found that the Marine Corps provided the best data for its study. GAO examined the records of all male Marine Corps officers who were commissioned between July 1, 1952, and June 30, 1960, and who were on active duty at the end of the year in some year between 1972 and 1980. Work-

ing with Marine Corps staff to correct inaccuracies in the data, GAO then looked at the records of the 1,005 unrestricted lieutenant colonels who were or would have been evaluated by the 1979-81 colonel selection boards. Of these officers, 588 stayed for selection-board evaluation and 417 left before they would have appeared before a colonel selection board.

WHAT DATA WERE AVAILABLE?

GAO had all performance evaluations for the full careers of each Marine officer in its sample. GAO also had year-end administrative data for each officer between 1972 and 1981. Included in these data were entries for schools attended, degrees attained, and titles and locations of jobs held as well as demographic figures.

HOW WAS QUALITY MODELED?

GAO used a quality measure that was based on an officer's performance and experience as a major and as a lieutenant colonel. Individual performance evaluations were used to construct a standardized performance measure of officers' rankings relative to their peers. All the measures were aggregated by grade for each officer in the analysis set and were then used as the performance component of quality. For the dimension of job experience, GAO looked at each officer's experience in four job groups as major and three job groups as lieutenant colonel. These groups were defined by a correlational analysis of jobs held by all officers who had been promoted to colonel.

HOW WAS QUALITY MEASURED?

GAO developed a classification equation that discriminated between officers who were promoted and officers who were not. The equation was based on the performance and experience records of 888 lieutenant colonels evaluated by the 1976-81 colonel selection boards. With this equation, GAO correctly classified 78 percent of the 888 officers. GAO used the equation also to measure the quality of the officers who left the service before being considered by a selection board. A "quality score" was calculated for every officer in a given year, and the scores were standardized to reflect ranking among peers and to make year-to-year comparisons between those who left and those who stayed.

THE MARINE CORPS RETAINED ITS BEST-QUALIFIED LIEUTENANT COLONELS

GAO classified as higher-quality 446 of the 1,005 officers in its analysis set. Nearly 68 percent, or 305, of these higher-quality officers were retained by the Marine Corps beyond 20 years of service for consideration for promotion to colonel. By comparison, only 56 percent, or 275 officers, of the 489 officers in the not-as-high-quality classification were retained. (The remaining 70 officers had incomplete records and were not classified.) As an occupational class, pilots and naval flight officers exhibited the lowest retention of higher-quality officers, at 63 percent, while the infantry exhibited the highest retention, at 79 percent.

In looking at retention rates (the number who stayed divided by the total number who were present in a given category), GAO found that retention did not seem to be affected by an officer's years of service, temporal proximity to a selection board, educational degrees beyond the bachelor, or career in either aviation or infantry occupations. Retention did seem to be affected by government-sponsored graduate education and by quality as indicated by GAO's measure.

HOW WAS EDUCATION ASSOCIATED WITH THE DIFFERENCES IN QUALITY AND RETENTION?

GAO found that graduate education (any academic degree above the bachelor) was associated, to a modest extent, with greater retention and higher quality. Graduate education was also associated with selective retention, or the difference between the retention of higher-quality and not-as-high-quality officers. However, when graduate education was broken into self-sponsored and government-sponsored education (that is, the special education and advanced degree programs sponsored by the Marine Corps), higher-quality retention was greater for self-sponsored education, and selective retention was greater for the government-sponsored programs.

GAO defined professional education as attendance at the intermediate-level service schools, or command and staff colleges. GAO found that the proportion of higher-quality officers was

greater among officers who attended command and staff colleges than among officers who did not and that attendance at command and staff colleges was also associated with retention. The retaining power of the intermediate-level schools extended about equally to the higher-quality and the not-as-high-quality officers. That is, retention extended to the higher-quality and not-as-high-quality components about equally. Thus, there seem to be two factors at work: the kind of sponsor and the kind of education.

EDUCATION WAS ASSOCIATED WITH COMPETITIVENESS

GAO found that officers with more education were more competitive for promotion to colonel. GAO also observed that the combination of training in the military's special education and advanced degree programs and attendance at command and staff colleges allowed even more competitiveness than the other education categories. However, officers with government-sponsored graduate education had less opportunity to attend command and staff college than officers without it.

THE AIM AND OPPORTUNITY

The obvious advantages to an agency that develops and maintains the type of personnel and performance data that GAO found in the Marine Corps are that retrospective analyses of personnel policies ("lessons learned") can be made and an empirical basis can be derived to support effective planning for staffing, training, and career development.

This study has taken one small step in examining the retention of "best-qualified" senior officers and the influence of education on selective retention. There are many other questions perennially confronting the services, ranging from the selection of officer candidates to the influence of working spouses on retention and military career patterns. Data bases containing consistent longitudinal information on performance and experience can provide valuable support for important analyses--analyses necessary for developing strategies to maintain desired capabilities. GAO compliments the Marine Corps for having such a data base available.

Officials of the Department of Defense reviewed a draft of this report and their oral comments have been incorporated as appropriate. The Department supported GAO's methodological approach and findings.

Contents

ABBREVIATIONS

ADP	Advanced degree program
AFRS	Automated Fitness Reporting System
DES	Data Encryption Standard
HMF	Headquarters Master File
ILS	Intermediate-level school or schooling
NFO	Naval flight officer
SEP	Special education program

CHAPTER 1

THE SCOPE OF THIS REPORT

The military retirement system has been a major public policy concern for many years, principally because of its cost.[1] It is said, moreover, that "there are no clear financial incentives in the present system either to stay or to leave the military after the completion of 20 years of service."[2] Indeed, the system has frequently been criticized as tending "to encourage some mediocre service men and women to remain in uniform while some of the best . . . leave as soon as they qualify for government pensions."[3] This criticism is a particularly important part of the policy debate because officer-promotion systems emphasize an "up-or-out" policy that is intended to selectively retain the "best-qualified" military leadership.

In order to provide empirical information on this topic, we addressed two basic questions:

--Did the "best-qualified" lieutenant colonels leave before being considered for promotion to colonel?

--Were quality and retention differentiated by
professional education,
academic education,
military occupational specialty,
years of military service, or
temporal proximity to a colonel selection board?

The data we examined were on male unrestricted officers of the U.S. Marine Corps.[4] For this reason, our findings may not be

---

[1]Federal budget outlays for military retirement have increased steadily and are projected to continue to do so. Outlays totaled less than $3 billion in 1970 and less than $12 billion in 1980. They are expected to exceed $20 billion in 1988. See U.S. General Accounting Office, Defense Spending and Its Relationship to the Federal Budget, GAO/PLRD-83-80 (Washington, D.C.: June 9, 1983), and The 20-Year Military Retirement System Needs Reform, FPCD-77-81 (Washington, D.C.: March 13, 1978).

[2]Richard V. L. Cooper, Military Retirees' Post-Service Earnings and Employment (Santa Monica, Calif.: Rand Corp., 1981), p. 46.

[3]Admiral Hyman Rickover, cited by Robert Dudney, "Behind New Furor over Military Pensions," U.S. News and World Report, January 9, 1984, p. 62.

[4]"Unrestricted" in that we excluded limited-duty officers, officers who were judge advocates, and certain categories of reserve officers who compete only among themselves for promotion.

typical of the other military services or of other officer groups.

Boards that select officers for promotion are charged with selecting the "best-qualified" of the officers who are under consideration.[5] Officers who elect voluntary retirement at the end of 20 years of service are typically no longer available for consideration by a selection board. Therefore, we compared officers electing voluntary retirement with officers who remained for consideration by a board. In doing so, we used a measurement tool that was based on Marine Corps records of performance and experience. With this tool, we evaluated performance in much the same way as a selection board would, except that our formulation was quantitative rather than qualitative.

The precise form of our quality measure was determined by analyzing the results of the 1976-81 colonel selection boards for male unrestricted officers. The quality "scores" that we obtained were based on reports on performance and experience for the grades of major and lieutenant colonel. Our analysis focused on the officers who were on the path leading to consideration by the 1979-81 colonel selection boards.

---

[5]Recognizing, of course, that the great majority of officers who are not selected under a "best-qualified" criterion are fully qualified to serve on active duty in their grade and professional specialties.

CHAPTER 2

THE METHODOLOGY

To get a sense of what would be possible in developing some sort of computerized analysis that could answer our questions, we entered into preliminary discussions with the U.S. Army, Air Force, Navy, and Marine Corps. In our discussions with the services, we explored the ways in which the performance of officers is rated, problems that the services could foresee in using the various rating forms as a source of data, the time periods covered by the forms, and the availability of computerized records. In this chapter, we discuss our reasons for narrowing our scope to the U.S. Marine Corps and describe our construction of a quality measure.

NARROWING OUR SCOPE TO THE U.S. MARINE CORPS

We decided to focus on the U.S. Marine Corps for several reasons. Of all the services, it has the best automated personnel data base. The history of its performance-reporting system is the most stable. Its officer corps is the most homogeneous. The size of the Marine Corps meant that we could work directly with the universe rather than developing a sampling strategy.

Defining the data base

In 1972, the Marine Corps changed its personnel appraisal form, which it calls a "fitness report," to one that was optically scanned. This greatly increased the amount of data routinely entered into the automated system and available to us. Additionally, year-end administrative data files, called the "Headquarters Master File" (HMF), were available for the Marine Corps for almost every year from 1972 on. The combination of these two data bases--the fitness report and the administrative data--provided us with more completely automated data than we could obtain from the other services.

Selecting a study group

Since our interest was the effect of the military's voluntary 20-year retirement provision, we selected for our study the officers who were in the eight "year groups" 1953 through 1960--that is, the date of their first commission was between July 1, 1952, and June 30, 1960. Officers in the 1953 group would have completed 20 years of commissioned service in 1972, the first year for which we had data from the automated personnel system. Officers in the 1960 group would have completed 20 years of commissioned service in 1981, the last year for which the automated data were available. From these eight year groups, we selected all male unrestricted officers who were listed in the administrative data base as having been on active duty for some interval between 1972 and 1981, obtaining a group of 3,119 officers.

CONSTRUCTING A MEASURE FOR QUALITY

In finding a way to analyze quality, we wanted a measure that would reflect the philosophy and policy of the Marine Corps regarding quality and that would be internally consistent with Marine Corps actions. We used the decisions of the selection boards as the basis for constructing a systematic measure.

We hypothesized that officers who are promoted are higher in quality than those who are not. We took performance and experience to be the major components or dimensions of quality. We also assumed that quality should indicate consistency of performance over several grades and several jobs--that is, it should reflect continuity during a long time rather than only the immediate past. Finally, we assumed that the attributes of quality change during an officer's career.[1] Attributes that contribute to the performance of a lieutenant may not be the attributes that are sought in a lieutenant colonel. This notion of changing attributes, combined with our need to keep the mathematical analysis within specific limits, led us to restrict our observation to the performance and experience of majors and lieutenant colonels. This is illustrated in the following notional equation (in which "Q" is "quality" and "Maj." and "Lt. Col." are the standard abbreviations for "major" and "lieutenant colonel"):

$$Q = \text{(performance and experience) Maj.} + \text{(performance and experience) Lt. Col.}$$

In the remainder of this chapter, we describe the components of our quality measure and our tests of its validity and reliability. Appendix I gives more detail on the components of quality and the way in which we developed relationships between them.

The components of the measure

The dimension of performance

To examine performance, we analyzed each officer's regular fitness reports. (A complete fitness report is reproduced in appendix II, which also gives more detail on the report's contents and use.) We did not use the supplementary reports that complement them. We were particularly interested in item 15 on the fitness-report forms, which asks for an estimate of a Marine's "general value to the service" and includes a

---

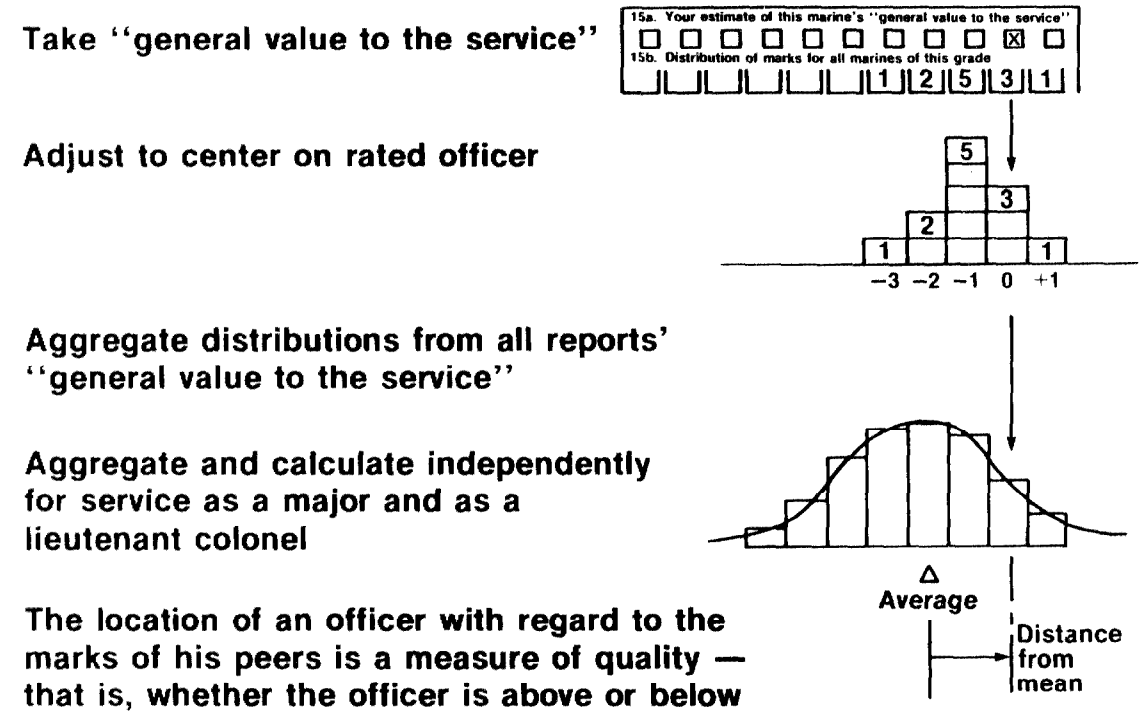
[1]See, for example, Morris Janowitz, The Professional Soldier (New York: Free Press, 1960).

distribution that shows how the Marine was rated relative to peers who were also under the supervision of the rating officer at the time of the report.

Item 15 and our methodology for making use of it are shown in figure 1. We relabeled the ratings so that they are centered

Figure 1

Measuring Relative Performance



on the officer being rated--that is, his score after the distribution has been shifted is "0." Then we aggregated the shifted distributions by grade for each officer and calculated an average for each aggregate. The location of the average is our measure of the performance of the officer relative to his peers. It tells whether his marks are above or below the average of the marks received by his peers.

The advantage of this procedure is that it takes into account any bias in the rating officer's judgment. Since the procedure gives a measure of standing among peers rather than an absolute score, an officer who has been rated as one of five "average" Marines, for example, will be considered as having the same mark as one of five who were all rated "outstanding."

The dimension of experience

We realized that high performance was important and that it mattered what an officer had done. Therefore, we categorized each officer's assignments according to broad types of experience, organizational levels within the types, and tasks within the levels that are inherent in officers' assignments. Each assignment as major and each assignment as lieutenant colonel was individually screened to determine which of 71 task categories it best fit into. Using a correlation analysis, we selected 31 jobs from the 142 categories (71 for each grade) and clustered the 31 jobs into seven broad experience groups. We used these seven groups, together with performance measures, as the input variables in the development of our quality measure. (We used a "none of the above" category for completeness but did not include it in the analyses. We discuss the process in detail in appendix I.)

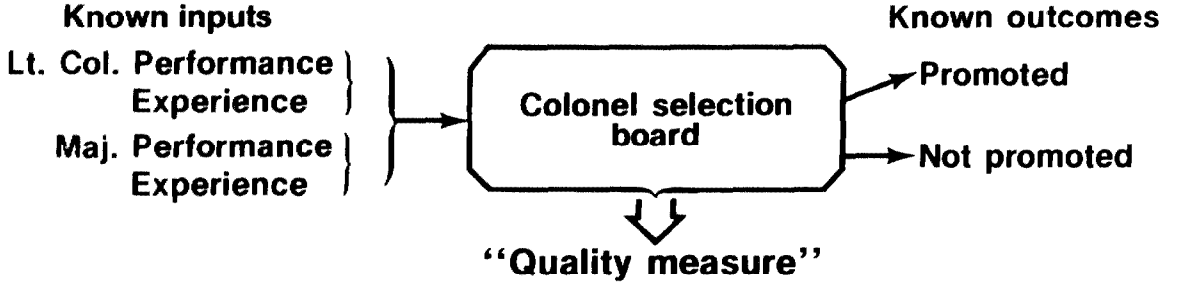
The development of a quality measure

To derive a quality measure, we analyzed the officers from year groups 1953 through 1960 who were in the promotion zones for the 1976-81 colonel selection boards. (Promotion zones are explained in appendix III.) These officers typically completed 20 years of commissioned service between 1976 and 1981. There were 1,045 officers who came before these six boards in the competitive category "male unrestricted officers." Of the 1,045, we eliminated 157 because performance data that we were looking for were absent for their service either as majors or as lieutenant colonels. (That is, records were incomplete in that available fitness reports failed our screening criteria: they were academic reports, ranked alone, or the like.) This left us with a final group of 888 officers.

Having defined quality as a measurement construct of performance and experience as a major combined with performance

Figure 2

Developing the Quality Measure



and experience as a lieutenant colonel, we applied a discriminant function analysis to the 888 officers in order to differentiate those who were promoted to colonel from those who were not. This process is indicated in figure 2. We treated the 1976-81 boards as one entity for the purpose of deriving our discriminant equation, and then we applied it to the six boards individually.[2]

We call attention, however, to the fact that education, particularly duties as a student, was not used as an input variable. Rather, we saw quality as something that should be explicitly a result of experience and job performance. Any influence of education would be observed as a result of better performance on the job, not as an a priori judgment. In addition, we were influenced by considerations of consistency: fitness reports on duties as a student (academic reports) do not normally contain rating information from item 15.

The validity of the measure

To test for validity, we applied our quality measure to the 1976-81 boards as a single entity and to each of the boards separately to see how well we could "predict" the selection boards' actual decisions on promotion. Assuming that the boards fulfilled their mandate to select only the best-qualified officers, we called "Q+" those who were higher in quality, in that we predicted their promotion. We called "Q-" those whom we predicted would be passed over for promotion and who were therefore not as high in quality.

In our test for validity, we assumed that an officer who was promoted was higher in quality than one who was not. We looked to see whether promoted officers, matched against our calculated value for quality, stood at or above the mean.[3] Testing against the boards' decisions for the whole 1976-81 period, we found that, overall, 78 percent of the officers were correctly classified with our measure. We also found that, given our measure for quality, we correctly classified 81 percent of the officers who were promoted to colonel after selection by these six boards. Our ability to predict those who were not promoted is not quite as high, but it is still an encouraging 73 percent. This result is in keeping with our reliance on only the experience and item-15 performance information from the fitness reports. We did not use other marks

---

[2] In the remainder of our analysis, we used only a single, fixed discriminant equation as our quality measure and did not modify it as we applied it to the different groups.

[3] To permit the comparison of scores from different distributions, we transformed all the scores that we obtained from the discriminant equation into standardized Z scores. It is to be understood that standardized scores in the rest of the analysis were also Z scores.

Figure 3

Actual Selections 1976-81 (n=888)

Quality	% Promoted	% Not promoted
Q+	81	19
Q−	27	73

or comments written on the form. The results of our test are given in figure 3.

We also tested the measure against the decisions of the six boards individually, and the results are shown in figure 4 as "Selections Correctly Predicted 1976-81." Overall, we classified selections correctly year by year at a low of 71 percent (for 1979) and a high of 85 percent (for 1976). However, the important figure is our 78-percent correct classification rate for the six boards combined.

We give the results of an additional test for validity. Again taking the aggregated distribution of ratings with peers, we calculated the quality measure separately for major and lieutenant colonel--one score accounting for an officer's performance and experience data at the grade of major only, one for his performance and experience as lieutenant colonel only. After standardizing these scores, we looked at their joint distribution, and we show the results in figure 5 as "Paired Measures for Officers Promoted 1976-81."

One would expect an officer who scored high as a major and also as a lieutenant colonel to have a greater chance of being

Figure 4

Selections Correctly Predicted 1976-81

	1976	1977	1978	1979	1980	1981	Combined
% Promoted	86	79	84	83	78	79	81
% Not promoted	79	76	60	60	82	77	73
% Overall	85	78	72	71	80	78	78

Figure 5

Paired Measures for Officers Promoted 1976-81 (n=888)

Major \ Lt. Col.	Q−	Q+
Q+	158 (42%)	310 (86%)
Q−	218 (15%)	202 (67%)

Key: Number of officers (Percent promoted)

selected than one who did not, and our figures substantiate this expectation. They also meet another expectation--that it was more important to do well as a lieutenant colonel than as a major if one did not excel at both. Sixty-seven percent of the 202 who excelled at the higher grade but not at the lower were promoted, while only 42 percent of the 158 who excelled at the lower grade but not at the higher were promoted.

The reliability of the measure

Next, we wanted to find out whether we could predict the quality of an officer who left before consideration by a colonel selection board. A first necessity was to demonstrate the reliability of the measure. That is, Was there stability in the measurements from year to year so that they could be used to make predictions? Reliability is a prerequisite for statements about the quality of officers who left before consideration by a colonel selection board vis-a-vis the quality of those who stayed.

To test the reliability of the measure, we analyzed the progressively greater amount of data for the 588 officers who actually appeared before the 1979-81 selection boards as they moved through the 3 years prior to their boards. We wanted to find out whether our measure as an indicator of quality was reliable. Would it predict consistently--in each of 3 years prior to a colonel selection board and in the year of the board--the quality of the 588 officers who would be selected in 1979, 1980, or 1981, given the selection board decisions? It did.

Figure 6

Reliability of Quality Classification for 1979-81 Board Cohorts

	Years prior to board 3	2	1	0		Group
Consistent	+	+	+	+	41%	76%
	−	−	−	−	35	
Single change	+	+	+	−	5%	20%
	+	+	−	−	3	
	+	−	−	−	3	
	−	+	+	+	3	
	−	−	+	+	2	
	−	−	−	+	4	
Mixed	+	+	−	+	1%	4%
	+	−	+	+	1	
	+	−	−	+	1−	
	−	−	+	−	1−	
	−	+	+	−	1−	
	−	+	−	−	1−	

The results of our progressive analysis, shown in figure 6, told us that we classified 76 percent of the group consistently. For another 20 percent of the group, our classifications changed only once. For the remaining 4 percent, our classifications were mixed: there were two or more changes in the predicted results. Our measure exhibits the reliability we would expect when it is applied to a group of officers who, with about 20 years of service, should not be expected to swing in the quality of their performance or experience from year to year.

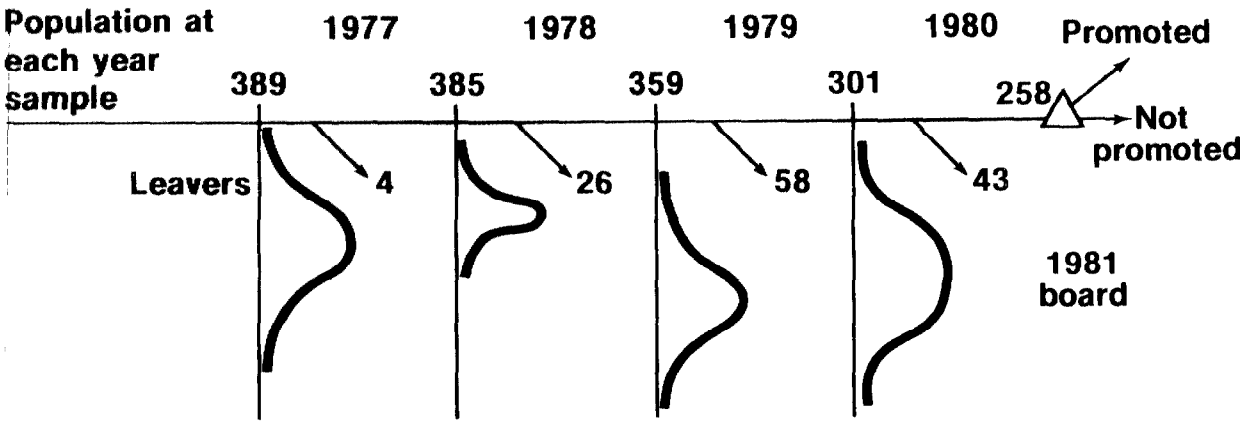
Measuring the quality of officers who left before being considered by a colonel selection board

We focused on three groups, or "cohorts," of officers--lieutenant colonels who would have been considered by the 1979, 1980, or 1981 board. We used a repetitive process, applying our single quality measure to everyone in each cohort who was present at the start of each year prior to the 1979-81 boards. The total number of officers in the three cohorts (the total number who would have been considered for colonel at the 1979-81 boards) was

1,005: there were 297 who actually were promoted, 291 who actually were not promoted but stayed, and 417 who left the service before they would have been eligible for selection. We used the standardized scores to make year-to-year comparisons between the officers who left in one of the years prior to their boards and the officers who stayed.

Figure 7

The Number of Officers "Present" Before the Board Compared to Those "Leaving" Before the Board



Illustrating our comparison process for the 1981 cohort, we can see in figure 7 that, at the beginning of 1978, there were 385 officers who might have been present before the 1981 board but that 26 left before 1978 ended. (We assumed that departures were for retirement rather than from death or other causes.) We applied the measure to all 385 and used standardized scores to make statements about the quality of the 26 officers who left. That is, we were able to say how the officers who left rated, in the year they left, compared to their peers.[4]

---

[4]Recall that we used only a single, fixed discriminant equation as our quality measure and did not modify it as we applied it to the different groups. The curves portrayed in figure 7 serve only to indicate that the distribution of values we obtain from applying the quality measure can differ every time the measurement is made. Since the population changes from year to year because officers leave, the underlying distribution in 1977 will most likely differ from that of 1978, 1979, or 1980.

We repeated the process for the other years leading to the 1981 board. At the beginning of 1979, there were 359 officers who might have been present before the 1981 board, but 58 left before the year ended. In 1980, there were 301 who might have been present, but 43 left before the year ended. When we consider the 131 "leavers" in 1977-80, we find 258 officers who were eligible for selection for the grade of colonel at the 1981 board, although at the start of 1977 there were 389 who might have been considered by that board. We used the same repetitive process for the 1979 and 1980 boards, which enabled us to make evaluative statements, based on performance and experience, about the officers who left the service and to compare them to those who stayed for selection.

CHAPTER 3

THE MARINE CORPS RETAINS ITS BEST OFFICERS

We stated in chapters 1 and 2 that our objective was to provide empirical data that could allow a focus on quality. In particular,

--Did the "best-qualified" lieutenant colonels leave before being considered for promotion to colonel?

--Were quality and retention differentiated by professional education, academic education, military occupational specialty, years of military service, or temporal proximity to a colonel selection board?

Recall that we used the word "quality" to refer to how an officer was ranked in terms of our quality measure. In this chapter, we report our general findings, what we found about years of service in relation to temporal proximity to a board, and the relationship between quality and education. (The data are supported with further detail in appendixes I and IV.)

GENERAL FINDINGS

Figure 8 depicts the overall results for the 1,005 officers in the three selection board cohorts. It shows that 417 left

Figure 8

The Numbers on High-Quality Retention: No "Hemorrhage of the Best and Brightest"

	Leavers	Stayers	
Q+	141	305	446
Q−	214	275	489
Q?	62	8	70
Total	417	588	1,005

Observation: 68% Q+ Retention
56% Q− Retention
12% Q+ Advantage

Figure 9

High-Quality Retention by Occupation

Pilot/NFO

	Leavers	Stayers	
Q+	51	86	137
Q−	67	100	167
Q?	29	1	30
Total	147	187	334

Infantry

	Leavers	Stayers	
Q+	29	110	139
Q−	62	81	143
Q?	13	4	17
Total	104	195	299

All others

	Leavers	Stayers	
Q+	61	109	170
Q−	85	94	179
Q?	20	3	23
Total	166	206	372

before consideration by the boards and 588 stayed--a retention of almost 59 percent. Before the 417 left, 446 of the 1,005 were rated higher in quality (Q+) and 489 less high in quality (Q-), and performance data were missing for 70 (Q?).[1] Q+ retention was 305/446; that is, approximately 68 percent of the higher-quality officers stayed for consideration by their boards. Similarly, 275/489, or approximately 56 percent, of the Q- officers (those who were not as high in quality) were retained. This is a 12-percentage-point advantage for higher quality: since a greater proportion of the higher-quality officers were retained, their relative proportion increased.

We looked for a difference in the retention of higher-quality officers by occupation (see figure 9). Pilots, for

[1]Most of the 70 Q? officers left before the selection board, but performance data on their service either as majors or as lieutenant colonels are incomplete. Basing their assignment to

example, are often singled out in discussions of retention, so we broke the 1,005 into 334 pilots and naval flight officers (NFOs), 299 infantry officers, and 372 in other occupations that encompass many disparate specialties. Retention in this "all others" occupational group proved similar to retention in the whole group before its division by occupations. That is, about 64 percent of the higher-quality "all others" were retained, and about 53 percent of the not-as-high quality "all others" were retained.

The examination shows also that the infantry retained the largest proportion of higher-quality officers--approximately 79 percent--and had the largest advantage in higher-quality retention--about 22 percentage points greater than not-as-high-quality retention. Pilots and naval flight officers who were higher in quality stayed in somewhat fewer proportions. Their retention was 63 percent Q+ and 60 percent Q-.

YEARS OF SERVICE AND TEMPORAL PROXIMITY TO A BOARD

We found that a large group of unrestricted officers left the Marine Corps at the end of 20 years of commissioned service. In 1977, for example, 113 of the 278 officers who were commissioned in 1957 left, but in 1978 the number of leavers from the same year group fell: 32 of the remaining 165 left at 21 years of commissioned service. Further analysis showed that most of those who left were still majors (officers whom the Marine Corps had already passed over for promotion to lieutenant colonel). Looking again at the 1957 year group, for example, we found that 36 of the 113 officers who left in 1977 were lieutenant colonels while 77 were majors. In other words, most of the attrition (68 percent) at the end of 20 years of commissioned service was among majors who were involuntarily retired.

Looking at the data in the form of percentage retention rates by years of service and by temporal proximity to a selection board allowed us to answer the question, Did the system encourage departure at the end of 20 years of service? We found that the rates were scattered. We also found that temporal proximity to a colonel selection board had no special effect on the retention of officers, whether at the end of 20 or 26 years of service.

The effect of education

Since we did not find that years of service or temporal proximity to a board affected retention in and of itself, we

---

the Q+ or the Q- group on group averages would leave the order and relative size of all ratios essentially unchanged. If one assumed that all Q? leavers had been Q+ officers, the order of some Q+ and Q- retention comparisons would change to favor Q-, lessening the strength of some of the observed associations.

turned our attention to temporal proximity to a board in terms of education. As we have noted, the military retirement system is frequently criticized as encouraging officers to leave at the end of 20 years for a second career. The criticism would seem to imply that education, especially postgraduate education, decreases retention because of greater employability.

The question becomes, Does educational attainment have an effect on the decisions of officers who are eligible for retirement? In the 4 years before a cohort's board, officers who had served for 20 years and had less than a bachelor's degree left at higher rates, but college graduates and postgraduates left at comparable rates, cancelling out any expectation that education is a magnet drawing military officers into the civilian labor force.[2] The proximity of a selection board had no particular effect on the retention of officers with graduate degrees.

The effect of occupation

If educational degrees did not by themselves lead to differences in retention at the end of 20 years of service, did they do so in combination with occupational specialties? We found that retention rates did not differ notably between aviation and infantry officers who had a bachelor's degree and those who had graduate degrees. Further, retention rates did not differ notably between aviation and infantry officers with only a bachelor's degree or between aviation and infantry officers with a master's degree or more.

Finally, the retention rates of officers with a bachelor's degree and officers with graduate degrees at the end of 20, 21, and 22 years of service were similar. That is, in all occupations, officers with graduate degrees left the Marine Corps at rates similar to the rates of officers with only a bachelor's degree.

There is another aspect to the relationship between education and occupation, however. Looking at the motivation for education, we asked whether there were differences between officers who had attained graduate degrees on their own and those who had completed graduate education through the military-sponsored special education program (SEP) or advanced degree program (ADP). SEP and ADP provide the Marine Corps with officers trained to fill specialist positions that require graduate education. (See appendix V on education sponsored by the Marine Corps.)

---

[2]We assumed that all lieutenant colonels who left before being considered for colonel did so by voluntary retirement (see footnote 3 on pages 33-34. We did not distinguish between major fields of study when we examined degree levels.

An officer whom the government is sending to school for advanced academic training might be thought of as being on a "fast career track" in the military. An officer who enters graduate school on his own might be thought of as preparing for a second career in the civilian labor market. Given this perception, one might expect that the officers trained through SEP or ADP would stay in the service and that the officers who had sponsored their own higher degrees would leave. The data, however, show just the opposite. We found that retention rates were lower for officers who attended SEP or ADP. (We discuss this finding later in this chapter.)

The effect of quality

Having found that years of service and temporal proximity to a board, and education and occupation in relation to these, did not reflect low retention rates at the end of 20 years of service, we turned to the question of whether or not officers "best-qualified" for promotion took advantage of the 20-year voluntary retirement provision to leave the service before being considered by a colonel selection board. The data show that, in all cases, the percentage retention rates for the higher-quality officers were higher than the rates for the not-as-high-quality officers.

THE RELATIONSHIP BETWEEN QUALITY, AS MEASURED BY THE QUALITY METRIC, AND EDUCATION

Since percentage retention rates did not seem to be affected by years of service in the Marine Corps, by temporal proximity to a colonel selection board, by whether an officer had a master's or other graduate academic degree, or by whether an officer was an aviator or in the infantry, and since retention rates did seem to be affected by the completion of the special education or advanced degree programs of the Marine Corps and by whether an officer was higher or not-as-high in quality, we used our quality measure to examine the relationship between education and quality. Recall that our measure deals only with performance and jobs held. It does not use education or educational achievement as an input variable.

In this analysis, we distinguished between graduate education and professional education. Graduate education is generally a civilian, as opposed to a military, academic course of studies beyond the bachelor's degree. Professional education is a military course of studies that aims at the specific goals of acquiring knowledge and skill in defense policy, management, strategy, and tactical leadership. Professional education is pursued primarily at the command and staff colleges, the military's intermediate-level schools (ILS). (See figure 10 on the next page.)

Figure 10

The Categories of Higher Education

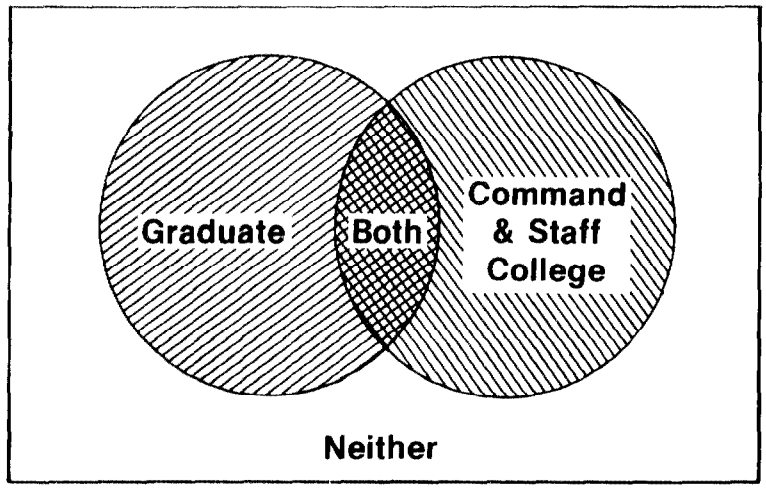


Figure 11

Quality by Graduate Education

	Less than B.A./B.S.	B.A./B.S.	M.A./M.S. +	
Q+	18	216	212	446
Q−	36	254	199	489
Q?	16	32	22	70
Total	70	502	433	1,005

Graduate education

Keeping this distinction in mind, we can look at the data in figure 11 on Marine Corps officers with graduate education. We found that officers who had at least a master's degree constituted 43 percent of our study group (433/1,005).[3] The same officers made up 48 percent of the higher-quality group (212/446).

There was a greater-than-expected difference of approximately 6 percentage points in the number of higher-quality officers who had attended intermediate-level schools, as we show in figure 12. Fifty percent (506/1,005) of the population were ILS graduates, and 56 percent of the higher-quality officers were

Figure 12

Quality by Professional Education

	Non-ILS	ILS	
Q+	196	250	446
Q–	258	231	489
Q?	45	25	70
Total	499	506	1,005

ILS graduates (250/446). The message that is conveyed by these data is that education did make a modest difference in the Marine Corps and that more education was associated with higher quality to a modest extent.

Having looked at quality without regard to years of service, we turned to the data for what they reveal about retention as it is related to quality. "Retention" is the percentage of all officers who were retained, or who did not leave before they became eligible for consideration by a colonel selection board. "Q+ retention" is the percentage of the higher-quality officers who stayed long enough to come up for consideration by a colonel selection board.

---

[3]Most of the charts that follow display numbers of Marine Corps officers in various categories. Since the total number is 1,005, it is easy to translate to percentages: every 10 Marines represent approximately 1 percent of the total.

But retention is one thing, and actions that improve the relative quality of the force remaining on active duty are quite another. To explore this phenomenon, we introduced the concept of "selective retention"--that is, the difference between the retention of higher-quality and not-as-high-quality officers. For example, if 80 percent of the higher-quality officers were retained and 45 percent of the not-as-high-quality officers were retained, there would be a 35-percentage-point difference favoring the retention of the officers of higher quality--a "selective" improvement of the force remaining on active duty. This is shown in figure 13.

Figure 13

An Illustration of the Concept of Selective Retention

	Leavers	Stayers	
Q+	25	100	125
Q–	55	45	100
Total	80	145	225

	High-quality stayers	80%	
Less:	"Not-so-high-quality" stayers	45%	
Equals:		35%	Selective retention

Now we can answer the question of how quality--specifically, higher quality--and more education--specifically, graduate education--were associated with retention. Looking at the data in figure 14, we found that both quality and retention were higher for officers who had at least a master's degree. While the numbers differed, the patterns were consistent:

--retention was higher for masters (276/433, or 64 percent) than bachelors (291/502, or 58 percent),

--quality was higher for masters (212/433, or 49 percent) than bachelors (216/502, or 43 percent),

--Q+ retention was higher for masters (155/212, or 73 percent) than bachelors (141/216, or 65 percent), and

Figure 14

The Association of Quality and Self-Sponsored Education with Retention

Stayers	Less than B.A./B.S.	B.A./B.S.	M.A./M.S. +	
Q+	9	141	155	305
Q–	12	145	118	275
Q?	0	5	3	8
	21	291	276	588
Leavers				
Q+	9	75	57	141
Q–	24	109	81	214
Q?	16	27	19	62
	49	211	157	417
Overall	70	502	433	1,005

--selective retention was higher for masters (73-59, or 14 percentage points) than bachelors (65-57, or 8 percentage points).[4]

However, higher education itself appeared to provide important dividends for the Marine Corps, but we found differences that depended on the source of the education. In particular, when we broke graduate education into the two components, self-sponsored (master's but not SEP/ADP) and government-sponsored (SEP/ADP), no single factor dominated:

--retention was higher for self-sponsored education (150/213, or 70 percent) than for SEP/ADP (136/250, or 54 percent);

--quality was lower for self-sponsored education (97/213, or 46 percent) than for SEP/ADP (129/250, or 52 percent);

--Q+ retention was higher for self-sponsored education (75/97, or 77 percent) than for SEP/ADP (85/129, or 66 percent); and

[4]Q- retention for masters was 118/199, or 59 percent, and Q- retention for bachelors was 145/254, or 57 percent.

--selective retention was lower for self-sponsored education (77-70, or 8 percent) than for SEP/ADP (66-47, or 19 percent).[5]

Stating this another way, we can say that while retention was greater for officers with self-sponsored degrees, officers with SEP/ADP credentials were selectively retained. That is, proportionately more higher-quality SEP/ADP graduates remained in the service for consideration by a colonel selection board, and the numbers of not-as-high-quality officers who left were proportionately greater. (See figure 15.)

Figure 15

The Association of Quality and the Source of Graduate Education with Retention

Stayers	M.A./M.S. + but not SEP/ADP	SEP/ADP	
Q+	75	85	160
Q–	73	50	123
Q?	2	1	3
	150	136	286
Leavers			
Q+	22	44	66
Q–	32	56	88
Q?	9	14	23
	63	114	177
Overall	213	250	463

Pursuing the differences in results for self-sponsored and government-sponsored graduate education, we looked at whether these differences were associated with occupation. We knew, of course, that the career paths are different for infantry officers and aviators. For example, an infantry officer commands

[5]Totals are not exact because the percentage-point difference was calculated before rounding.

Figure 16

The Association of Quality, Occupation, and Source of Graduate Education with Retention

	Pilot/NFO			Infantry			All others		
Stayers	M.A./M.S.+ but not SEP/ADP	SEP/ADP		M.A./M.S.+ but not SEP/ADP	SEP/ADP		M.A./M.S.+ but not SEP/ADP	SEP/ADP	
Q+	20	16	36	30	26	56	25	43	68
Q−	24	18	42	22	11	33	27	21	48
Q?	1	0	3	1	0	1	0	1	1
	45	34	79	53	37	90	52	65	117
Leavers									
Q+	5	10	15	9	10	19	8	24	32
Q−	7	13	20	11	13	24	14	30	44
Q?	3	5	8	3	2	5	3	7	10
	15	28	43	23	25	48	25	61	86
Overall	60	62	122	76	62	138	77	126	203

first as a captain and an aviator commands first as a lieutenant colonel. The operational experiences and the timing of them differ greatly between occupations. Any one of these differences could have had some influence on the retention and quality differences between officers with self-sponsored degrees and officers with SEP/ADP credentials.

The data reveal that aviators differed from infantry officers and all others in that their selective retention was lower. Figure 16 (on the preceding page) gives the specific data on the selective retention of officers with a self-sponsored degree: pilot and naval flight officers, 3 percentage points; infantry, 10 percentage points; all others, 10 percentage points. The figure also gives the comparable data for their peers with SEP/ADP: pilots and naval flight officers, 3 percentage points; infantry, 26 percentage points; all others, 23 percentage points. These numbers show also that, except for the aviators, officers who had SEP/ADP training exhibited greater selective retention than officers with a self-sponsored master's degree.

Professional education

Professional education is the avenue through which an officer receives a formal education in the job of soldiering. Officers acquire new skills and new perspectives at each professional school that they attend. The importance of command and staff colleges and the war colleges has been noted by others:

> "It is precisely because these higher institutions supply an opportunity to build a reputation that they operate so effectively in the career management of the professional soldier. Attendance at a higher military school brings together officers who have been scattered throughout various military installations. Superiors and peers have an opportunity for mutual judgment, and these judgments form part of the formal and informal record on which promotions are based."[6]

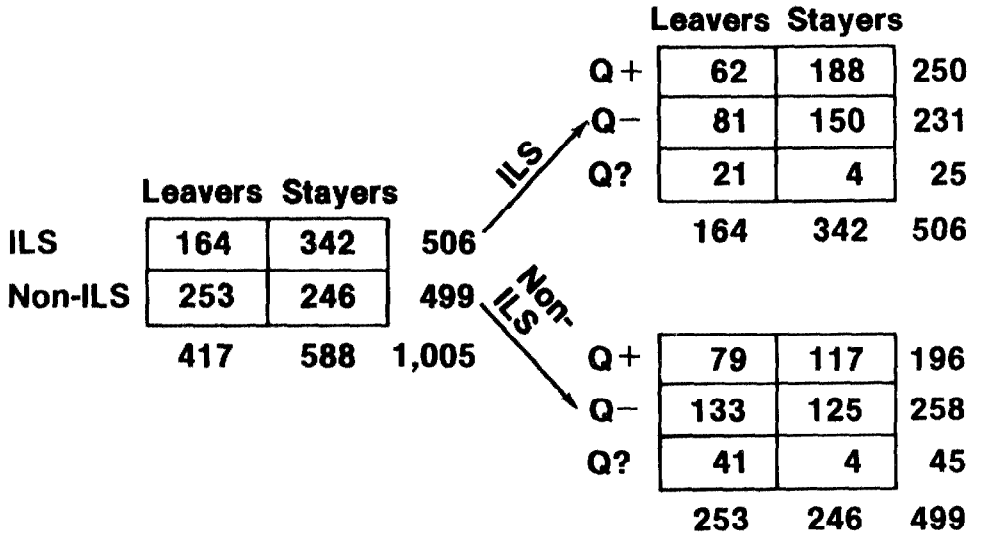
Turning to the data on professional education, we found that intermediate-level schooling at command and staff colleges was associated with the retention of more officers and more higher-quality officers (see figure 17). Only 49 percent (246/499) of the officers who did not attend ILS were retained, while 68 percent (342/506) of those who did attend were retained. Only 39 percent of those who did not attend were higher-quality officers, while 49 percent of those who did attend were higher-quality officers.

---

[6]Janowitz, p. 140.

Figure 17

The Association of Quality and Professional Education with Retention



The numbers on retention for higher-quality and not-so-high-quality officers with ILS are 75 percent Q+ and 65 percent Q-. The corresponding numbers for officers who did not attend ILS are 60 percent Q+ and 48 percent Q-. This leads to the observation that attendance at command and staff colleges was not associated with selective retention (that is, the differences are approximately equal). In other words, attendance at command and staff colleges led to greater retention but was not selective in retaining the higher-quality officers.

We looked also at attendance at top-level schools but only to verify the consistency of our method, because top-level schooling occurs so late in an officer's career. We found, as expected, that most of the officers who had top-level schooling were higher-quality officers (91 percent) as ranked on the metric, and most of the officers who had top-level schooling (97 percent) were retained.

Graduate and professional education

It is important to notice that access to ILS was not equal for all officers:

--50 percent of the 1,005 officers attended ILS, but only

Figure 18

The Association of Quality and Government-Sponsored Education with Retention

Stayers	None	ILS	SEP/ADP	Both	
Q+	66	154	51	34	305
Q−	88	137	37	13	275
Q?	4	3	0	1	8
	158	294	88	48	588
Leavers					
Q+	49	48	30	14	141
Q−	87	71	46	10	214
Q?	30	18	11	3	62
	166	137	87	27	417
Overall	324	431	175	75	1,005

--30 percent of the officers who had SEP or ADP training attended ILS.[7]

Accordingly, we looked at officers with SEP/ADP training separately from officers with ILS. As figure 18 shows, we found that

--retention was greater for SEP/ADP and ILS (48/75, or 64 percent) than for SEP/ADP alone (88/175, or 50 percent),

--quality was greater for SEP/ADP and ILS (48/75, or 64 percent) than for SEP/ADP alone (81/175, or 46 percent),

--Q+ retention was greater for SEP/ADP and ILS (34/48, or 71 percent) than for SEP/ADP alone (51/81, or 63 percent), and

[7]These numbers break down as follows: 506 officers had ILS (431 had ILS only, plus 75 officers had both ILS and SEP/ADP); 250 officers had SEP/ADP (175 had only SEP/ADP, plus 75 officers had ILS as well as SEP/ADP); this gives 506/1,005 who had attended ILS and 75/250 officers with SEP/ADP who had attended ILS.

--selective retention was slightly lower for SEP/ADP and ILS (71/57, or 14 percent) than for SEP/ADP alone (63/45, or 18 percent).

We examined the hypothesis that SEP/ADP education and their attendant assignments might injure an officer's competitiveness for promotion to colonel. The hypothesis was based, in part, on the idea that "specialist assignments" might jeopardize the acquisition of critical experience in an officer's primary occupational field and thus place him at a competitive disadvantage with his peers. However, the data from the three selection boards that we examined showed just the opposite:

Education	Probability of selection	Probability if Q+
Neither professional nor graduate	0.29	0.66
Only		
Professional	0.51	0.73
Graduate		
Self-sponsored	0.51	0.76
Government-sponsored	0.55	0.78
Both professional and graduate		
Self-sponsored	0.61	0.84
Government-sponsored	0.67	0.85
Overall	0.51	0.76

Stating this another way, we can say that

--officers who had SEP/ADP training had an above-average probability of promotion, and

--officers who had SEP/ADP training and had attended ILS had the highest probability of being selected for promotion to colonel.

CHAPTER 4

SUMMARY

We have presented the results of an empirical investigation into the influence of the voluntary retirement provision on the retention of "best-qualified" senior Marine Corps officers. Our measure of quality was based on experience (jobs held) and performance at the grades of major and lieutenant colonel. We applied the measure to the 1,005 lieutenant colonels who were "on course" to be considered for promotion by the 1979-81 colonel selection boards. Using our measure, we estimated the competitive status of the 417 officers who left the Marine Corps after 20 years of service and before they were considered by a colonel selection board.

Our principal finding was that 68 percent of the higher-quality lieutenant colonels stayed in the service until they were considered by a colonel selection board. Thus, from this group, the Marine Corps retained the majority of its "best-qualified" officers. Although 56 percent of the not-as-high-quality officers were also retained, the 12-percentage-point difference in favor of the retention of "best-qualified" officers increased the relative proportion of higher-quality officers among all those who were considered by the selection boards.

RETENTION RATES

We found that differences in retention rates were not associated with temporal proximity to a colonel selection board, possession of a graduate degree beyond a bachelor's degree (for officers with 20-22 years of service), or a career in aviation versus one in the infantry. The rates did differ, however, between higher-quality and not-as-high-quality officers and between education that was self-sponsored and education that was government-sponsored.

THE INFLUENCE OF EDUCATION

We found that education--both nonmilitary graduate education and professional military education--made a modest difference to the Marine Corps. Officers who had graduate education, whether on their own or through the sponsorship of the Marine Corps, tended to be concentrated in the higher-quality category. Similarly, graduate and professional education were also associated with retention. Officers who had a master's degree and officers who had attended an intermediate-level service school were somewhat more likely to be retained than those who had not.

Looking at professional education in isolation, we found that the retaining power of the intermediate-level schools extended about equally to the higher-quality and the not-as-high-quality officers.

Graduate education, by contrast, revealed a different pattern--especially when separated into SEP/ADP (government-sponsored) training and self-sponsored schooling. There was greater retention of the higher-quality than of the not-as-high-quality officers with SEP/ADP. Similarly, there was greater retention of the officers with self-sponsored graduate education, but the magnitude of the difference was greater for the SEP/ADP officers.

We found also that the officers who attended SEP/ADP had the least opportunity to attend ILS. Retention was greater for officers who attended both SEP/ADP and ILS than for those who attended SEP/ADP only. Moreover, of the officers who were considered by the selection boards, those who attended both SEP/ADP and ILS had the greatest probability of being promoted to colonel.

THE AIM AND OPPORTUNITY

While the Marine Corps's personnel reporting systems have evolved to meet managerial needs, it is especially noteworthy that the Marine Corps has preserved the quantitative and qualitative richness of its personnel and performance data since 1961 (particularly since 1972).

The obvious advantages to an agency that develops and maintains the type of personnel and performance data that we found in the Marine Corps are that a retrospective analysis of personnel policies ("lessons learned") can be made and an empirical basis can be derived to support effective planning for staffing, training, and career development.

This study has taken one small step in examining the retention of "best-qualified" senior officers and the influence of education on selective retention. There are many other questions perennially confronting the services, ranging from the selection of officer candidates to the influence of working spouses on retention and military career patterns. Data bases containing consistent longitudinal information on performance and experience can provide valuable support for important analyses--analyses needed to develop strategies for maintaining desired capabilities. Our compliments to the Marine Corps for having such a data base available.

Officials of the Department of Defense reviewed a draft of this report and we have incorporated their oral comments as appropriate. They supported our methodological approach and our findings.

APPENDIX I

METHODOLOGICAL DETAILS

Interest in the current military retirement system necessarily reflects not only staffing policies and practices but also budgetary pressures. Sound empirical data are obviously prerequisites to decisions in these areas. Therefore, we undertook our empirical investigation in order to find out whether the data match the perceptions we indicated in chapter 1. Specifically, we wanted to see what is revealed by a particular focus on quality versus quantity. What differentiates the higher-quality officers from the others? How do officers who are promoted differ from those who are not? We hoped to find out whether quality and retention were differentiated, for example, by

--professional education,

--academic education,

--military occupational specialty,

--years of military service, or

--temporal proximity to a colonel selection board.

We sought in our design to maximize what has been called "internal validity"--assurance that the findings were attributable to the program we studied rather than to other, extraneous factors. Thus we selected a service in which we could examine almost all officers, the largest competitive subgroup in that service, with a highly stable, reliable data base.

The size of the Marine Corps meant that we could deal directly with the relevant population rather than developing a strategy for selecting a group or sample of officers from one of the larger services. In 1980, the Marine Corps had approximately 18,000 officers on active duty, the Army 98,000, the Air Force 97,000, and the Navy 64,000.

Marine Corps officers compete among themselves for promotion within competitive categories. These categories include, among others, male unrestricted officers, limited-duty officers, and attorneys who are judge advocates. By examining only male unrestricted officers, the largest of the active-duty competitive categories, we were able to treat all unrestricted officers as equals and did not have to take special career-advancement patterns into account.

The format and the definition of terms in the fitness reporting system of the Marine Corps have been remarkably stable. Of particular interest to us was a question asking for an estimate of an officer's "general value of the service": the same question, defined in the same way, has been in use since before 1950. Changes have been made to the form--for example, a question on "growth potential" was added in 1959 and by 1971 moved

to another section of the form--but these changes did not affect the utility of the "general value" item or an item added in 1960 asking for the distribution of marks.[1] Moreover, combining the Marine Corps fitness report and administrative data bases provided a more complete set of automated information than could be obtained from the other services.

THE DATA BASES

We assembled our data in three steps. First, we looked at administrative data--the information in the Headquarters Master File (HMF), collecting data for December 31, 1972, through December 31, 1981. Second, we looked at the performance records in the Automated Fitness Reporting System (AFRS). Third, we joined selected data from both files for each officer in the population.

The Marine Corps Headquarters Master File archive contains more than 300 fields of information on all Marines. Data items include social security number, race, marital status, number and age of dependents, types and dates of military and civilian schooling, academic degrees, military occupational specialties, medals and other awards, date of birth, date of original entry into the armed forces, and date of commissioning as an officer. The HMF does not contain the records of the performance evaluations that officers receive throughout their careers.

The AFRS performance records, or fitness reports, are maintained separately and have more than 100 fields of information on each officer. They include job title, name of the unit through which the reports are filed, assessments of the performance of regular duties, qualities, and general value to the service. (In appendix II, we give more detail on the contents and use of the fitness report.)

The fitness reports and other information from the administrative files are compiled in a "selection-board jacket," which is used by a nine-member selection board convened periodically to evaluate and recommend for promotion the officers who have become eligible for selection. (In appendix III, we briefly describe career progression in the Marine Corps as it relates to our topics, the promotion procedure, and the composition and duties of the selection board.) Other data that go inside the jacket may include reference to such favorable matters as certificates, citations, and awards or official comments on unfavorable performance. Attached with the jacket is the special overview document called the "selection-board brief" that is prepared for the assistance of the members of the Marine Corps boards.

---

[1]Before 1960, only the rating was recorded. This change showed how an officer stood among peers.

PROTECTING PRIVACY

Our analytic approach required our building a portion of this brief, but we were concerned that we satisfy considerations of individual privacy and the confidentiality of records. Therefore, we developed a computer program that incorporated the Data Encryption Standard (DES), a federally approved standard for safeguarding the transmission and storage of all data that are not classified according to the National Security Act of 1947, as amended, or the Atomic Energy Act of 1954, as amended.[2] Then we asked Marine Corps staff to strip specific personal information from each HMF record--an officer's name, the name and social security number of a spouse, and the like. Under our guidance, the Marine Corps staff used our DES package to encode each officer's social security number and replace the actual number with the encoded number. This guaranteed privacy while giving us the depth of detail that we needed. The paired social security number and code were then provided to the staff maintaining the AFRS data, who similarly inserted the encoded numbers, providing us with actual but anonymous records.

While preserving privacy and confidentiality, the DES encoding was useful also in "data cleaning." That is, when we had a problem with apparently inconsistent data, we were able to ask the Marine Corps to decode the numbers we used as identifiers, track down the original information, and correct the data.

THE SIZE OF THE OFFICER COHORTS

We collected approximately 15,000 HMF records and 241,000 AFRS records for 3,303 officers. On their career histories in particular, we had job experience and performance evaluation histories from the first commission date as second lieutenant through the last available report.[3] However, we do not have

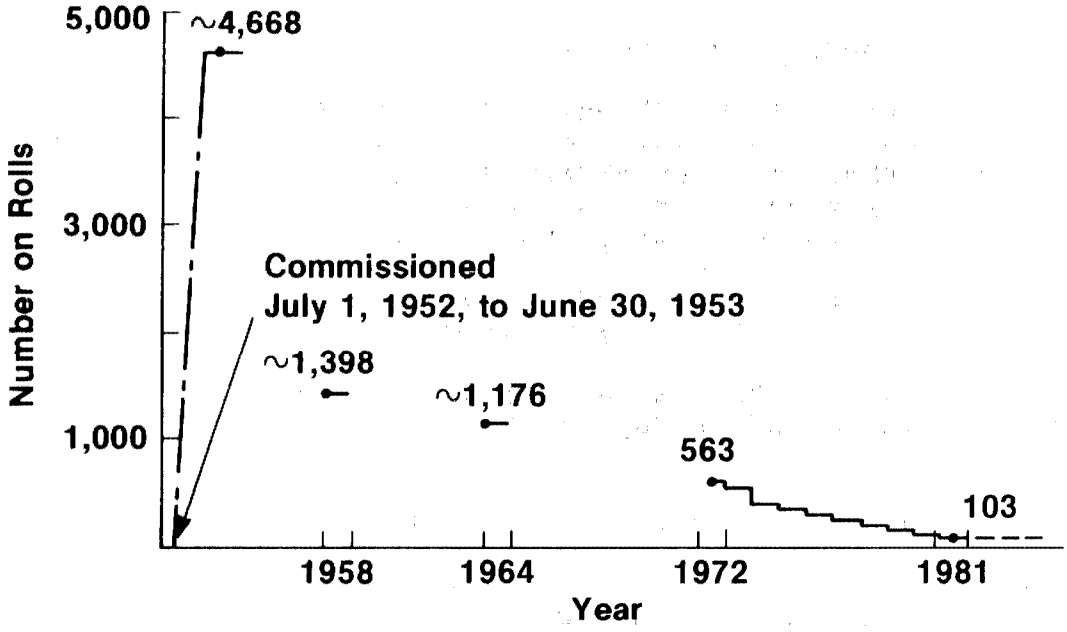
---

[2]Federal Information Processing Standard Publication 46, National Bureau of Standards, Washington, D.C., 1977. Although the standard has been designed for implementation as an electronic circuit, and is a standard only for such circuits, our program duplicated the electronic codebook mode of operation that is referred to in the standard. The DES takes as inputs a user-selected code key and an 8-byte string of data to be encoded; it outputs an encoded 8-byte string derived from the code key and the input string. For a given key, unique inputs produce unique outputs, a necessary condition in any matching activity.

[3]The AFRS report "stream" ends for a given officer either at the date of the data retrieval or with the last report submitted before the officer left the service. Many of these last, but not necessarily current, reports identify officers as having retired. For cases in which the report stream just ends, we

Figure 19

Officers on Active Duty from the Class of 1953



histories for all officers who were ever in the eight year groups 1953-60.

Officers whose first commission was after July 1, 1952, and who left before our first selection point of December 31, 1972, are unknown and not in our study population. Figure 19 illustrates how attrition affected our selection of officers for study. Approximately 4,668 officers were commissioned in the year group or class of 1953. (The number is approximate because the names in the January 1, 1953, and January 1, 1954, rosters of active-duty officers are not in complete agreement.) Five years later, only about 1,398 of these officers were still on active duty, and in 1964, or 11 years after commissioning, the number

---

have presumed retirement rather than some other way of leaving the service such as resignation, involuntary separation, accidental death, or death in combat. This presumption that all officers who left the Marine Corps at the end of 20 years of commissioned service did so only by retiring is the weakest link in our conclusions on the retention of high-quality officers. That is, if any high-quality officers we counted as retired should have been counted as having left for reasons other than retirement, our percentages on the retention of high-quality officers would be adjusted upward.

had further decreased to about 1,176. By December 31, 1972, the opening date for our study's purposes, the class of 1953 was down to 563 officers. Retirements and other forms of attrition brought it down to a total of 103 officers at the end of 1981, our last data point. Attrition worked in similar ways in the other year groups.

The exclusion of special categories

These numbers include not only male unrestricted officers but also those who were in special promotion categories or who had unique career paths. When we excluded lawyers and other specialists, who are evaluated by separate promotion provisions when they appear before a selection board, the numbers decrease. For example, looking at all officers in the class of 1953 who were on active duty on or after July 1972, we see that about 6 percent were excluded for unique careers or special promotion categories:[4]

Class of 1953: officers on active duty during or after July 1972		= 563
Exclusions		
Limited-duty officers	= 11	
Lawyers	= 7	
Reserves	= 12	
Special and unique careers	= 2	
Officers with enlisted status	= 4	
		36
Analysis subset: career histories		527 officers

We have complete career coverage for the officers who remain after all exclusions. This point is illustrated by the class of 1953 analysis subset. Figure 20 (on the next page) shows the size of the analysis group year by year and indicates the percentage of the class of 1953 officers on active duty that the analysis subset represents.

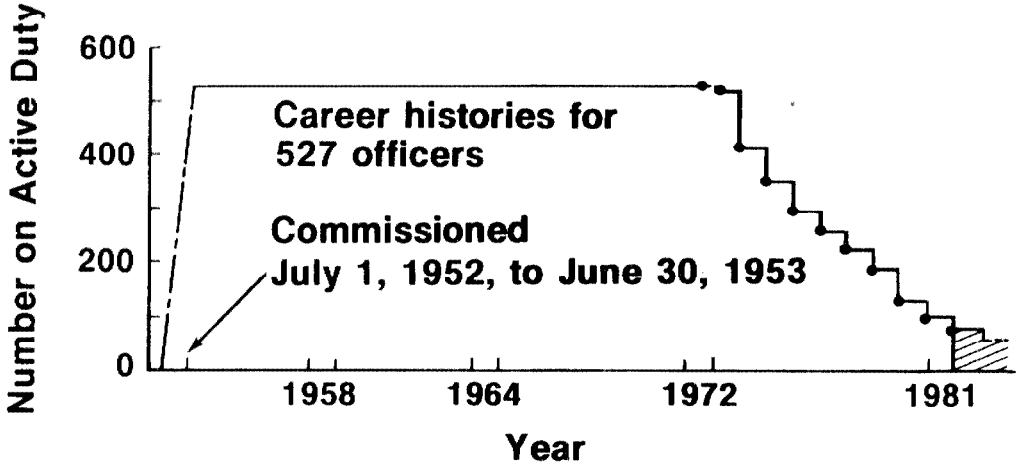
Focusing on the selection boards for male unrestricted officers has the advantage that the boards are charged with selecting the best-qualified candidates for promotion; they have no quotas by occupational specialty. Thus, we could drop other competitive categories from consideration and concentrate on performance and experience as the elements of quality.

---

[4]Officers with unique careers generally do not have the same types of experience as others in the cohort. Officers in special promotion categories are often evaluated by separate boards and compete under a "comparative fitness for duties to which assigned" rather than the "best fitted for promotion" criteria of unrestricted officers. Officers with enlisted status are those with enlisted records dated after they first became officers.

Figure 20

Class of 1953 Analysis Subset



Year	Analysis group	% Active roll (worst case)
1954	527	11.3
1958	527	37.7
1964	527	44.8
1973	521	100.0

Year	Analysis group
1973	521
1974	405
1975	350
1976	297
1977	258
1978	227
1979	191
1980	130
1981	103

The inclusion of promotion-zone officers

During the period between an officer's first duty at the grade of lieutenant colonel and his first consideration by a colonel selection board, the "due course officer" completes 20 years of commissioned service.[5] It should be noted, however,

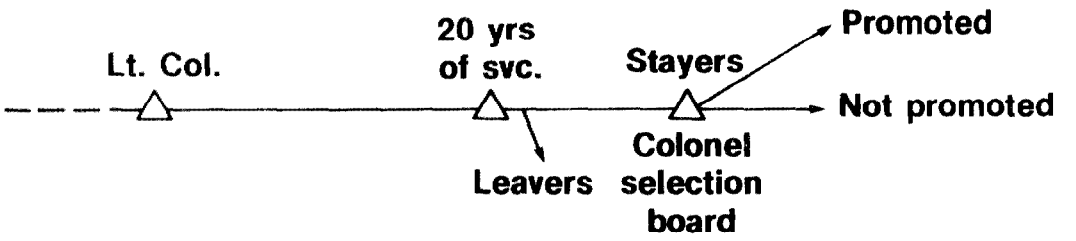
---

[5]The "due course officer" is the hypothetical active-duty officer who follows a model career pattern. He has never failed to be selected for promotion while in a promotion zone nor been promoted from below the zone. He has served on active duty continuously from the date of his commissioning. He has not received credit for service prior to commissioning. He has not lost precedence relative to his peers.

that years of commissioned service may not be an exact reflection of an officer's total years of service. Many officers have served some time prior to their first commissioning. As soon as they complete 20 years of service, 10 of which have been as a commissioned officer, they may request voluntary retirement.

Figure 21

Model Career Patterns



When we speak of officers considered by a selection board, we are referring explicitly to officers who are in the "promotion zone" for selection to the next grade:

> "An officer in any grade who becomes eligible for consideration for promotion shall, regardless of failure or failures of selection for such promotion, remain so eligible while on the active list of the Marine Corps . . . ."[6]

Officers who are eligible for promotion to a given grade and have not yet failed in a selection proceeding for that grade are candidates within the promotion zone at the convening of a board. Thus, of two lieutenant colonels eligible for promotion to colonel, both of whom are in the promotion zone, one may be selected for promotion and the other may fail the selection but will remain eligible for future promotion at each subsequent board. Although

> "the status of having once failed of selection for promotion shall not be considered as prejudicial to an officer with respect to . . . eligibility for selection for promotion by the next succeeding selection board,"[7]

---

[6]Marine Corps Promotion Manual MCO P1400.29B (Washington, D.C.: Department of the Navy, March 1982), pp. 2-3.

[7]Marine Corps Promotion Manual, pp. 2-3.

the likelihood of being selected for promotion tends to decrease with each new board, given the record of the past.

THE QUALITY MEASURE

After establishing the dimensions of our quality measure--and its validity and reliability--we applied the measure to determine the competitiveness of lieutenant colonels who left the service before they entered the promotion zone for selection to the grade of colonel. In the remainder of this appendix, we discuss the components of quality and the relationships between them.

Assessment of performance

Item 15 is reproduced in figure 1 (the entire form is in appendix II). Item 15a asks for

> "the reporting senior's estimate of how the Marine compares with all other Marines of the same grade known by the reporting senior, taking into consideration all important factors such as performance, versatility, potential, and preference for having the Marine as a member of the command."[8]

The form is either marked "not observed" or checked at some point on a 10-point scale from "unsatisfactory" through "outstanding."

Item 15b asks the rating officer to "record numerically in the appropriate column the total number of Marines of the same grade" who are being marked at each score and who are

> "under the reporting officer's supervision at the time of the report. This distribution serves to advise the members of selection . . . boards . . . of the relative standing of a Marine within a population of the same grade and should provide the discrimination necessary to identify truly outstanding Marines as well as those needing improvement."[9]

Because of our decision to use the distribution, we used only reports indicating that a Marine had been "marked with others." That is, if a fitness report indicated the officer was being ranked as "1 of 1," we did not count it. We also excluded academic reports, supplementary reports, the rating officers' written comments (which are, in any case, not represented in the automated system), item 16 on "attitude toward having this Marine under your command," and unit-location information. After these exclusions, 84 percent of the officers had four or more reports

---

[8]Marine Corps Order P1610.78, Performance Evaluation System (Washington, D.C.: Department of the Navy, February 1977), pp. 3-7.

[9]Marine Corps Order P161.78, pp. 3-7.

as a major and 90 percent had four or more as a lieutenant colonel.

Assessment of experience

We divided job experience into seven broad categories and defined their organizational levels as we looked for experience in each category. We ended up with 71 specific tasks. They represent the types of duties that are listed in The Marine Officer's Guide and that are listed in the fitness reports. We used the tasks as categorical variables to record whether the officer we were looking at had held any of these jobs. We did not make value judgments about them. Moreover, the quality of job experience did not enter into our quality measure.

For example, experience in the category "civilian interaction" refers to assignments with reserve or recruiting organizations. These jobs typically require interaction with the public, whether recruiting civilians to serve in the military, acting as liaison with public interest groups, or the like. Within this category, experience is further described by the organizational level at which it is obtained and by the tasks to which an officer is assigned within that level. Figure 22 (on the next page) shows the seven broad categories at the top of each column, above the organizational levels at which experience is obtained.

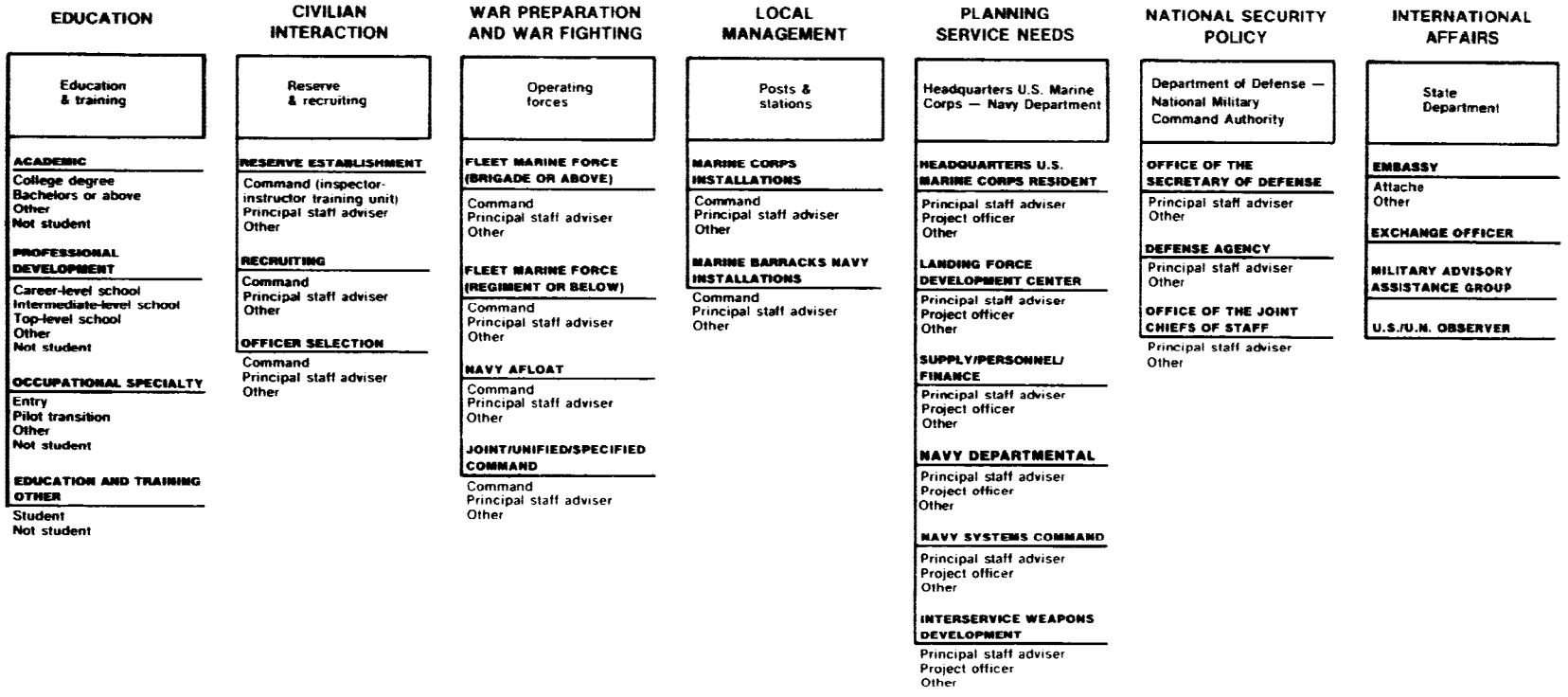
It should be noted that the experience in reserve and recruiting is obtained in work assignments as a commander, as a principal staff adviser to the commander, or in some other capacity.[10]

---

[10]Under "command," we include the commanding officer and principal deputy or executive officer. Below commander, officers are either those whom commanders seek advice from face to face (and who are likely to have a commander's special trust and confidence) or those who serve on the staff of a commander's principal adviser. This is, for example, the difference between the operations officer on a general's staff and an assistant operations officer reporting to the operations officer. The Marine commander's staff has three subdivisions: general (or executive) staff, special staff, and personal staff. The general (or executive) staff is a coordinating group that plans and supervises all the basic functions of command. It includes the personnel, intelligence, operations and training, and logistics officers and, in the major commands, a comptroller. The special staff are specialist advisers and assistants organized to fill a particular need of the commander. They may include a disbursing officer or an artillery officer, for example. The personal staff are administered directly by the commander and perform only such duties as the commander personally directs. We have taken the principal officers of the general and special staffs to be the principal staff advisers.

Figure 22

The Dimension of Job Experience



APPENDIX I

APPENDIX I

The seven components of experience can be characterized as follows:

Experience	Characteristic of activity typically required
Education and training	Student, instructor, school director
Reserve and recruiting	Civilian interaction
Operating forces	Planning and conducting military operations
Posts and stations	Local management
Headquarters U.S. Marine Corps-Navy Department	Planning and programming overall Marine Corps enterprise
Department of Defense-National Military Command Authority	Formulating national military policy
State Department	International affairs among the allied nations

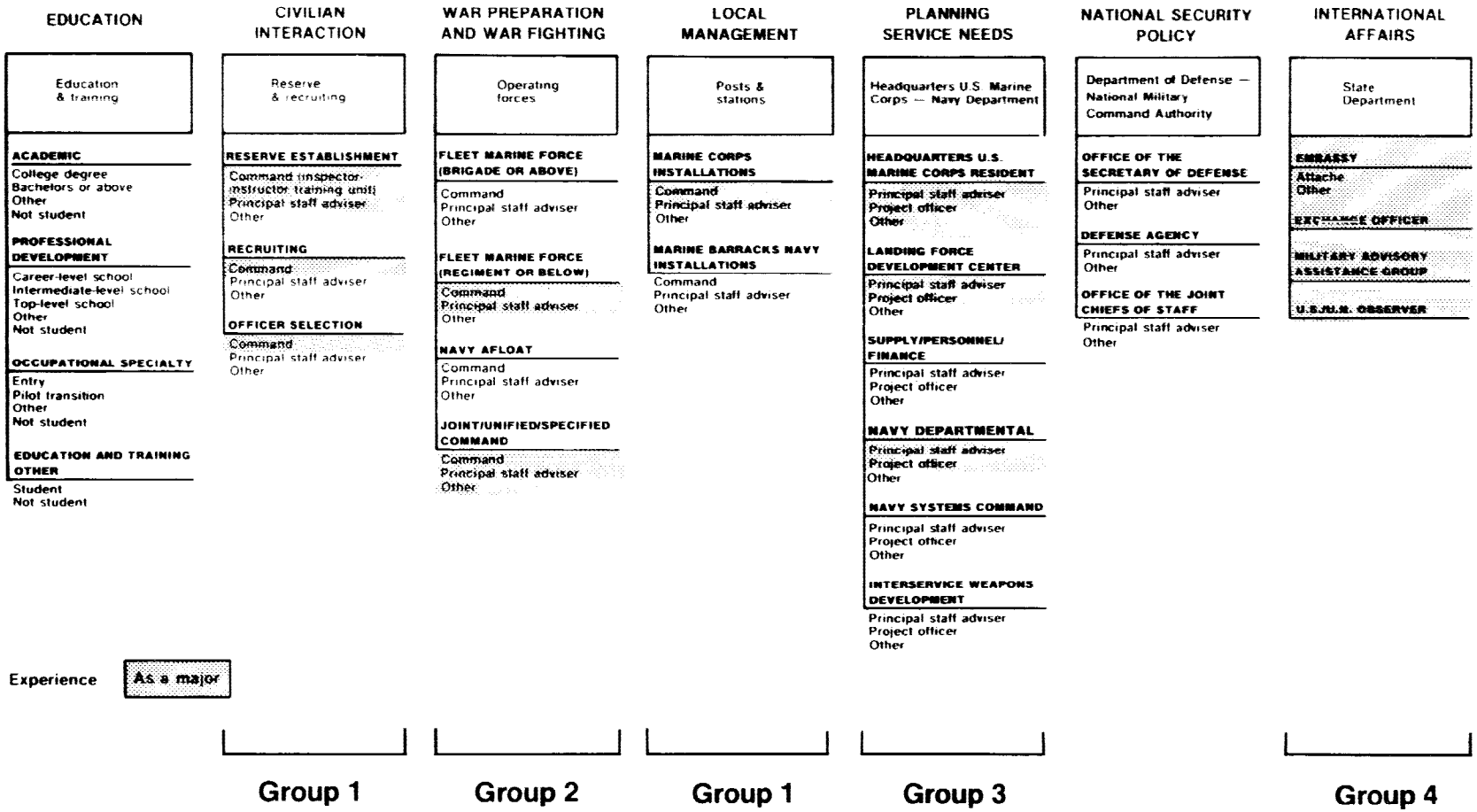
Overall, this structure accounts for most of the general types of experience that an officer can obtain in the course of a career in the armed forces. For completeness, we used a "none of the above" category (including tasks such as hospital and competition at arms), but we did not include it in the analysis.

Using this structure for coding job titles as recorded on the fitness reports gave us a uniform set of descriptors for our analyses. However, using the full set of job descriptors for all the officers in our population would have necessitated massive data translation, so we selected the class of 1953 as a test. All jobs for this group were coded on the most detailed tasks for all grades from second lieutenant through colonel. Then we correlated these jobs with the jobs we knew had been held by officers who were promoted to colonel. This was done separately for both majors and lieutenant colonels for the 71 job categories. The categories with the highest correlations were regrouped into larger categories, and the process was repeated.

At the conclusion of this procedure, we selected a number of jobs that appeared to be basic experience variables: 20 jobs among majors and 11 among lieutenant colonels. We clustered them into four experience groups for majors and three for lieutenant

Figure 23

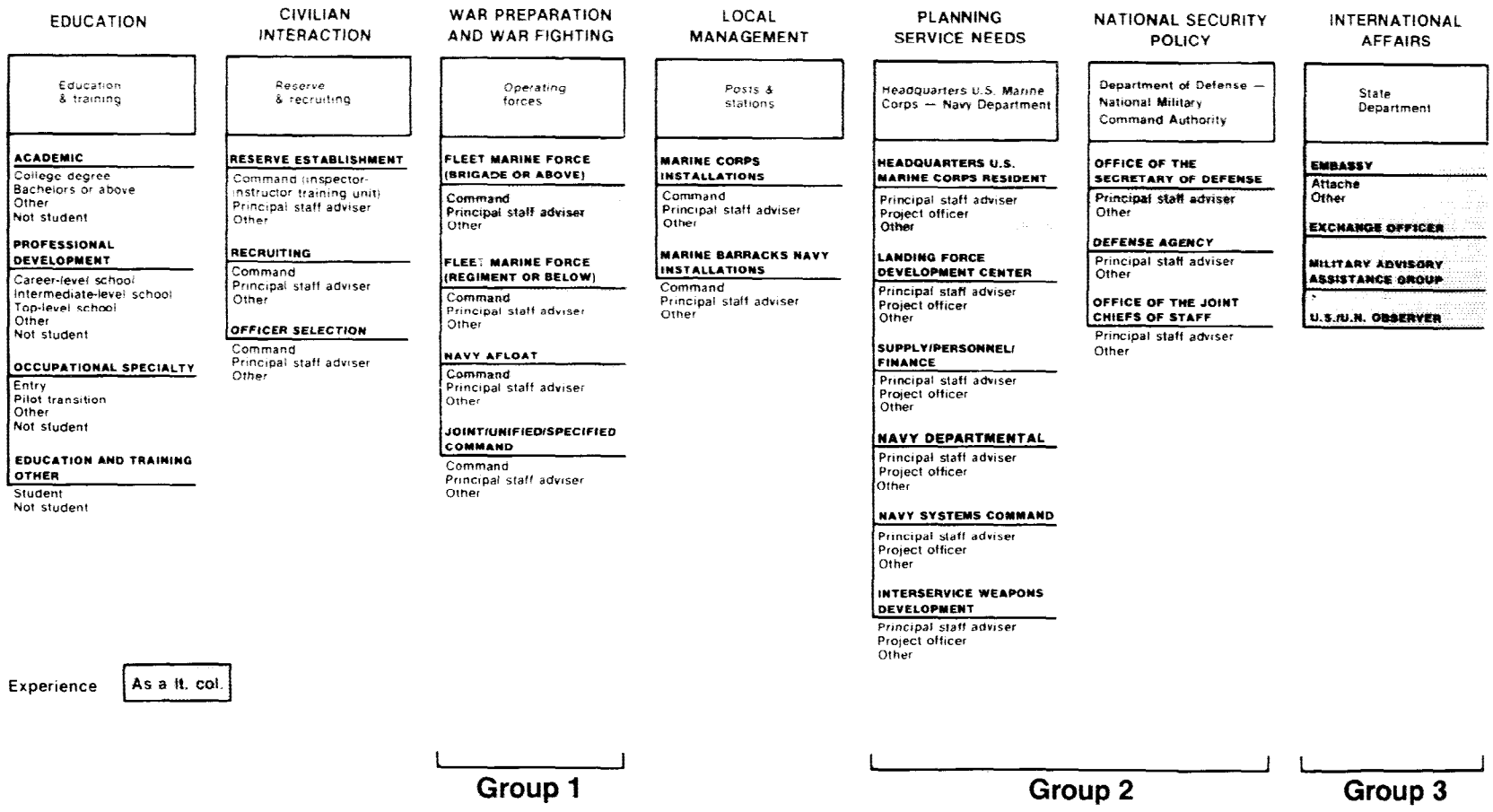
The Dimension of Job Experience for Majors



APPENDIX I

Figure 24

The Dimension of Job Experience for Lieutenant Colonels



APPENDIX I

colonels (as shown in figures 23 and 24).[11] Experience in these seven groups was associated with promotion to colonel in the sense that the groups were selected from the 142 jobs examined in the correlation analysis. The decision to make these clusters was influenced by our interest in reducing the number of explicit variables. The groups were composed of related tasks; a modified coding scheme that differentiated between the seven groups further reduced the manipulation of data.

---

[11]An important point in our analysis is that we made no a priori judgments about the relative merits of the experience. The jobs were used as binary variables--either they were held by an officer or they were not. It is the presence or absence of a form of experience and not the number of jobs held by all the officers that influences the value of the constant term in our discriminant function. There is an element of "ticket-punching" in receiving credit for an experience group if a job within the group was held. However, the performance variables played the most significant role in determining the discriminant value. Therefore, it was not sufficient to have had the "right experiences." To be selected for promotion, it was necessary to have done well in them.

MARINE CORPS FITNESS REPORTS

The Marine Corps uses an evaluation report, referred to as a "fitness report," to record periodically the performance of all Marines relative to others of the same grade and comparable experience. Specific information that is gathered on the form includes duties performed, preferences for future assignments, an evaluation of personal and professional characteristics, and an estimate of the Marine's general value to the service and professional acceptability to the officer responsible for completing the form.

Selection boards use the information in the fitness reports for determining which officers are best qualified for promotion. The reports are used also to provide others in the Marine Corps with information on each officer's qualifications for various types of duty. More generally, the fitness reports are prepared for two purposes, for which the reports are called "regular" and "supplementary." Regular reports provide a continuous chain of information on an officer's career, from the date of commissioning until either the date of leaving the service or the date of the most recent report. Each officer's entire career must be covered by an unbroken string of consecutive regular reports. Supplementary fitness reports are submitted as desired or as required but do not eliminate the requirement for regular reports. The time period covered by a supplementary report must also be covered by a regular report.

A regular report is required whenever the officer responsible for the report is transferred or the officer being reported on is promoted, is assigned a significant change in primary duties, is transferred at the completion of formal military or civilian education, or completes 12 months of attendance in school. Reports must be filed semiannually on set dates unless the semiannual reporting period will end within 30 days of an event whose reporting requirement takes precedence over the semiannual report.

The format and definition of terms that the Marine Corps has used in its fitness reporting system have been remarkably stable since the 1930's. Because our attention was focused on the period of our study, however, we researched the continuity of the instructions for filling out only the 1952-72 fitness reports. We obtained copies of all relevant Marine Corps orders and bulletins from 1953 through 1981 in order to track changes to the form and its instructions. For illustration, the current form and the 1964 form are reprinted on pages 46 and 47.

We found a number of changes that did not affect our analyses. Before 1961, completed reports were returned to the Marines being rated. A definition for "marginal" reports was added in 1963, but after 1961, a report was no longer shown to the Marine being rated unless the report was either adverse or marginal.

APPENDIX II

Figure 25

1984 Fitness Report Form

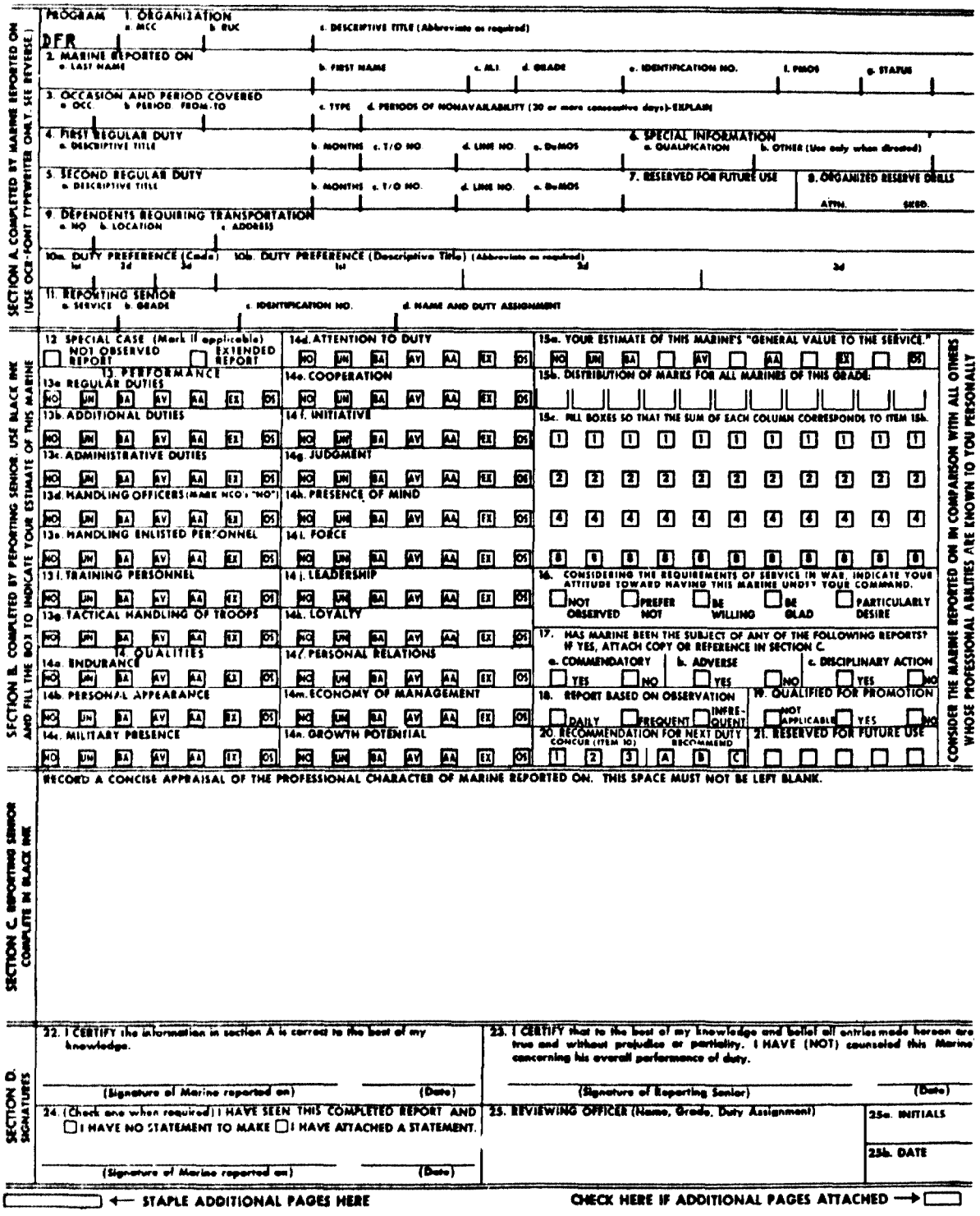
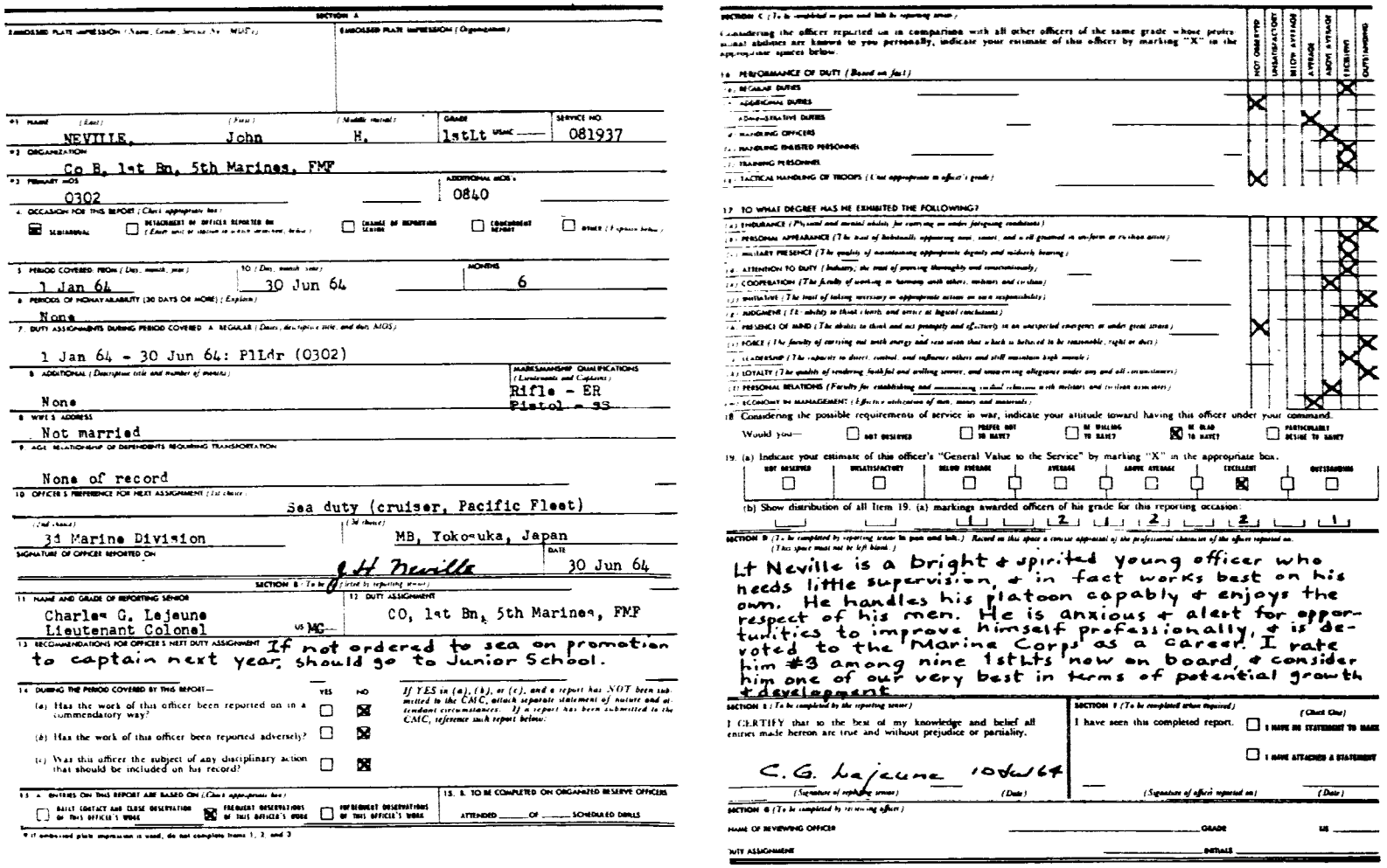


Figure 26
1964 Fitness Report Form



SECTION A

1. NAME: NEVILLE, John H. — GRADE: 1stLt USMC — SERVICE NO: 081937
2. ORGANIZATION: Co B, 1st Bn, 5th Marines, FMF
3. PRIMARY MOS: 0302 — ADDITIONAL MOS: 0840
4. OCCASION FOR THIS REPORT: ☒ SEMIANNUAL ☐ DETACHMENT OF OFFICER REPORTED ON ☐ CHANGE OF REPORTING SENIOR ☐ CONCURRENT REPORT ☐ OTHER
5. PERIOD COVERED: FROM 1 Jan 64 TO 30 Jun 64 — MONTHS: 6
6. PERIODS OF NONAVAILABILITY (30 DAYS OR MORE): None
7. DUTY ASSIGNMENTS DURING PERIOD COVERED: A. REGULAR: 1 Jan 64 - 30 Jun 64: PlLdr (0302)
8. ADDITIONAL: None — MARKSMANSHIP QUALIFICATIONS: Rifle - ER; Pistol - SS
9. WIFE'S ADDRESS: Not married
10. AGE, RELATIONSHIP OF DEPENDENTS REQUIRING TRANSPORTATION: None of record
11. OFFICER'S PREFERENCE FOR NEXT ASSIGNMENT: Sea duty (cruiser, Pacific Fleet)
12. 3d Marine Division — MB, Yokosuka, Japan
SIGNATURE OF OFFICER REPORTED ON: J.H. Neville — DATE: 30 Jun 64

SECTION B (To be completed by reporting senior)

13. NAME AND GRADE OF REPORTING SENIOR: Charles G. Lejeune, Lieutenant Colonel, US MC
14. DUTY ASSIGNMENT: CO, 1st Bn, 5th Marines, FMF
15. RECOMMENDATIONS FOR OFFICER'S NEXT DUTY ASSIGNMENT: If not ordered to sea on promotion to captain next year, should go to Junior School.

16. DURING THE PERIOD COVERED BY THIS REPORT —

	YES	NO
(a) Has the work of this officer been reported on in a commendatory way?	☐	☒
(b) Has the work of this officer been reported adversely?	☐	☒
(c) Was this officer the subject of any disciplinary action that should be included on his record?	☐	☒

If YES in (a), (b), or (c), and a report has NOT been submitted to the CMC, attach separate statement of nature and attendant circumstances. If a report has been submitted to the CMC, reference such report below:

17. ENTRIES ON THIS REPORT ARE BASED ON: ☐ DAILY CONTACT AND CLOSE OBSERVATION OF THIS OFFICER'S WORK ☒ FREQUENT OBSERVATIONS OF THIS OFFICER'S WORK ☐ INFREQUENT OBSERVATIONS OF THIS OFFICER'S WORK
18. TO BE COMPLETED ON ORGANIZED RESERVE OFFICERS: ATTENDED ____ OF ____ SCHEDULED DRILLS

* If embossed plate impression is used, do not complete Items 1, 2, and 3

SECTION C (To be completed by senior)

Considering the officer reported on in comparison with all other officers of the same grade whose performance and abilities are known to you personally, indicate your estimate of this officer by marking "X" in the appropriate spaces below.

	NOT OBSERVED	UNSATISFACTORY	BELOW AVERAGE	AVERAGE	ABOVE AVERAGE	EXCELLENT	OUTSTANDING
16. PERFORMANCE OF DUTY (Based on fact)							
(a) REGULAR DUTIES						X	
(b) ADDITIONAL DUTIES							
(c) ADMINISTRATIVE DUTIES							
(d) HANDLING OFFICERS							
(e) HANDLING ENLISTED PERSONNEL							
(f) TRAINING PERSONNEL							
(g) TACTICAL HANDLING OF TROOPS (If not appropriate in officer's grade)							
17. TO WHAT DEGREE HAS HE EXHIBITED THE FOLLOWING?							
(a) ENDURANCE (Physical and mental stability for exercising an office under foregoing conditions)							
(b) PERSONAL APPEARANCE (The kind of individuality, appearing neat, smart, and well groomed in uniform or civilian attire)							
(c) MILITARY PRESENCE (The quality of maintaining appropriate dignity and military bearing)							
(d) ATTENTION TO DUTY (Industry; the trait of pursuing thoroughly and conscientiously)							
(e) COOPERATION (The faculty of working in harmony with others, initiative and civilian)							
(f) INITIATIVE (The trait of taking necessary or appropriate action on one's responsibility)							
(g) JUDGMENT (The ability to think clearly and arrive at logical conclusions)							
(h) PRESENCE OF MIND (The ability to think and act promptly and effectively in an unexpected emergency or under great stress)							
(i) FORCE (The faculty of carrying out with energy and resolution that which is believed to be reasonable, right or duty)							
(j) LEADERSHIP (The capacity to direct, control, and influence others and still maintain high morale)							
(k) LOYALTY (The quality of rendering faithful and willing service, and unswerving allegiance under any and all circumstances)							
(l) PERSONAL RELATIONS (Faculty for establishing and maintaining cordial relations with associates and civilian acquaintances)							
(m) ECONOMY IN MANAGEMENT (Effective administration of men, money and materials)							

18. Considering the possible requirements of service in war, indicate your attitude toward having this officer under your command.
Would you — ☐ NOT DESERVED ☐ PREFER NOT TO HAVE? ☐ BE WILLING TO HAVE? ☒ BE GLAD TO HAVE? ☐ PARTICULARLY DESIRE TO HAVE?

19. (a) Indicate your estimate of this officer's "General Value to the Service" by marking "X" in the appropriate box.

NOT DESERVED	UNSATISFACTORY	BELOW AVERAGE		AVERAGE		ABOVE AVERAGE		EXCELLENT		OUTSTANDING
☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	☐

(b) Show distribution of all Item 19. (a) markings awarded officers of his grade for this reporting occasion: 1 | 2 | 1 | 2 | 2 | 1

SECTION D (To be completed by reporting senior in pen and ink.) Record in this space a concise appraisal of the professional character of the officer reported on. (This space must not be left blank.)

Lt Neville is a bright & spirited young officer who needs little supervision, & in fact works best on his own. He handles his platoon capably & enjoys the respect of his men. He is anxious & alert for opportunities to improve himself professionally, & is devoted to the Marine Corps as a career. I rate him #3 among nine 1stLts now on board, & consider him one of our very best in terms of potential growth & development

SECTION E (To be completed by the reporting senior)

I CERTIFY that to the best of my knowledge and belief all entries made hereon are true and without prejudice or partiality.

C. G. Lejeune — 10 Jul 64
(Signature of reporting senior) (Date)

SECTION F (To be completed when required)

I have seen this completed report. (Check One)
☐ I HAVE NO STATEMENT TO MAKE
☐ I HAVE ATTACHED A STATEMENT
(Signature of officer reported on) (Date)

SECTION G (To be completed by reviewing officer)

NAME OF REVIEWING OFFICER ____ GRADE ____ US ____
DUTY ASSIGNMENT ____ INITIALS ____

Reprinted from Robert D. Heinle, Jr., The Marine Officer's Guide, 2nd ed. (Annapolis, Md.: U.S. Naval Institute, 1964), pp. 246-47.

APPENDIX II

We examined item 13, "Performance," and item 14, "Qualities," for their utility, but neither item afforded much discrimination or strong predictive ability. Item 15, "Your Estimate of This Marine's 'General Value to the Service,'" was our principal indicator of performance. Although it has undergone a steady sequence of modifications, it has shared the form's overall stability.

For example, the distribution of marks in item 15b was added to the fitness report immediately prior to a 1961 revision of the instructions. The absence of this information before 1961 does not affect our data on the 1979-81 colonel selection boards, however. All the officers in our analysis were promoted to major after 1960, so that we do have the distribution information for them in the grades of major and lieutenant colonel. The presence of the distribution in item 15 made it possible to correct for bias in the raters' markings.

Other changes in item 15 after 1961 were primarily changes in style rather than substance. For example, later instructions make it clear that the distribution of marks is to include all officers of a given grade who are supervised by the reporting officer and not merely the officers being marked on the day of the report; instructions from the early 1960's were ambiguous about defining the peer group. The sequence of instructions indicates that the intention remained the same. Similarly, the instructions make clear that the ranking in 15a and the distribution in 15b are to refer to the same set of Marines. The definitions of the rating categories ("below average," "average," and so on) were consistent in the period of our interest.

In 1972, the Marine Corps automated its personnel reporting system and made some changes to the format of the report. The major change was to convert the form into one that could be optically scanned. (The older and newer formats are sometimes referred to respectively as "P reports" and "S reports" to distinguish "pre-scan automation" from "scan automation" data.) The main effect of this change was that all the information in the "substructure" of the questions on performance of regular duties and general value to the service could be read into the automated files. With the old format, only the single overall score for "general value" was entered into the data base. The new format made it possible to pick up the information on ranking relative to peers as well.

The Marine Corps entered the "substructure" data from the older forms for officers who appeared before selection boards after about 1975 but not for most officers who left the service without appearing before selection boards. For the latter, we had to use the older format to obtain information between their entry into the Marine Corps and 1972.

CAREER PROGRESSION AND PROMOTION IN THE MARINE CORPS

During the period covered by our review, the Officer Personnel Act of 1947, as amended, mandated the procedures for career progression and promotion in the Marine Corps. The Marine Corps is a closed personnel system in that new officers enter at the bottom of the career ladder. In some circumstances, officers may leave active duty and return to the service at the same level they relinquished, but this is not common. In general, military personnel do not enter the service at upper levels as they do in the civilian labor force.

The act defined categories of officers for promotion purposes and established the number of officers and, thus, the number of vacancies for promotion at each grade.[1] In the period of our review, the quotas were based on the number of commissioned officers on active duty at any given time and were computed at Marine Corps Headquarters and approved by the Secretary of the Navy.

Promotion to the grade of first lieutenant was by seniority. Promotion to the grades of captain and above was by selection. Eligibility for selection was determined by years of service in grade. Eligibility did not necessarily mean that an officer would be considered for promotion, but an officer who became eligible and remained on active duty remained eligible for promotion, even after having been considered and passed over, or not recommended, by a selection board.

Each time a selection board convened, the Secretary of the Navy determined how far down the list of eligible officers the board was to go in order to make sure of a satisfactory flow of promotions. For each grade under consideration, this "promotion zone" began with the most senior officer who had not previously failed to be selected and went down to the last unrestricted officer needed to fill the quota that had been approved by the Secretary of the Navy.[2] The number of officers in the zone was

---

[1]The act dealt with two types of promotion, temporary and permanent. Although there were legal differences between them, a reference to a promotion generally meant a temporary promotion.

[2]It is helpful to understand the process by visualizing a roster that contains the names of all active-duty officers. The officers are listed in order of seniority so that the first name on the list is that of the officer holding the highest grade with the earliest date of rank within that grade. The last name on the list is the officer holding the lowest grade with the latest date of rank. A promotion zone for a particular

thus a function of the number to be selected (the quota) and the selection rate. It is essentially correct to say that lieutenant colonels who had been twice passed over for selection for promotion to colonel had to retire on June 30 of the year in which they completed 26 years total commissioned service.

Selection boards considered for promotion the officers who were within the promotion zone and those who were above it. They were also permitted to consider and select outstanding officers from below the promotion zone for accelerated career progression, although there was a limit to the number any given board could select. Officers who were below the promotion zone, who had been considered by a board, and who had not been selected were not said to have been passed over or to have failed the selection process.

Selection boards were convened at least once a year by the Secretary of the Navy. Generally, different boards met to consider different competitive categories. Each board was made up of nine active or retired officers, at least three of whom had to be aviators. No officer was allowed to serve on two successive boards for the same grade. All members were sworn to "act without prejudice or partiality," and they were prohibited from disclosing their deliberations. Their obligation with respect to regular officers was to recommend for promotion, by at least a two-thirds majority vote, the officers who were the best qualified, giving equal weight to the performance of technical and administrative duty and duty in aviation and supply. They were not to be prejudiced against officers who had been considered by previous boards and passed over. They were at liberty to select fewer than the number that the Secretary of the Navy had established for a satisfactory flow of careers.

The names of officers who were selected for promotion were placed on a promotion list in normal order of seniority. The list was submitted for approval to the Commandant, the Secretary of the Navy, the Secretary of Defense, and the President, who was authorized to remove names from it. Usually the entire list was approved. Promotions were effected, subject to Senate confirmation, according to the number of vacancies in the grade ahead.

---

grade is a segment of the roster that begins with the name of the most senior officer not previously considered for promotion to the next higher grade and that contains the number of names determined by the Secretary of the Navy.

RELATIVE HOLDING POWER: COLONEL SELECTION BOARD

VERSUS 20 YEARS

There is a perception that many officers leave the Marine Corps at the end of 20 years of service--before the time they would have been considered by a colonel selection board. Figures 27 and 28 show the number of officers in year groups 1957 and

Figure 27

Attrition 20 Years After Commissioning

As of January 1	No. in year group	
	1957	1959
1975	320	292
1976	301	289
1977	278	286
1978	165	272
1979	133	237
1980	115	147
1981	103	128

Figure 28

Attrition by Grade 20 Years After Commissioning

As of January 1	Year group					
	1957			1959		
	Maj.	Lt. Col.	Col.	Maj.	Lt. Col.	Col.
1975	109	211	-	291	1	-
1976	92	209	-	124	165	-
1977	82	196	-	86	200	-
1978	5	160	-	72	200	-
1979	-	131	2	52	185	-
1980	-	51	64	-	147	-
1981	-	25	78	-	121	7

1959 who were on active duty between 1975 and 1981. Figure 27 appears to support this perception, highlighting the period 20 years after commissioning. The closer examination in figure 28 shows that the group who leave at the end of 20 years of service contains a large subgroup--the majors who were passed over for promotion to lieutenant colonel and, thus, involuntarily separated from the service. Since all such majors were not, and would not be, in the competition for selection to colonel, we did not consider them further.

When dealing with the concept of personnel staying in or leaving, the services generally favor descriptions that refer to "attrition" rather than "retention." (Possibly this has a basis in actions that are targeted at those who are leaving.) The remaining figures in this appendix deal with quantifying differences among rates and are presented in terms of attrition.

TEMPORAL PROXIMITY TO BOARDS DID NOT AFFECT ATTRITION

We calculated the percentage attrition rates for the three selection board cohorts cross-tabulated by years of service and temporal proximity to a colonel selection board. Figure 29 shows

Figure 29

Percentage Attrition Rates by Years of Service and Years Prior to a Board (Number Leavers/Number Present)

Years of service	Years prior to selection board				Total
	4	3	2	1	
20	9	21	31	24	25
21	24	11	17	15	16
22	22	20	21	17	19
23	0	33	22	15	18
24	10	7	21	7	10
25	0	0	14	9	8
26	0	33	22	17	16
Total	14	19	25	17	

Figure 30

Percentage Attrition Rates by Quality for Years of Service and Years Prior to a Board

Number Leavers/Number Present by Years of Service

	20	21	22	23	24	25	26
Q+	19	12	12	17	8	0	0
Q−	29	18	23	18	11	17	36

Number Leavers/Number Present by Years Prior to Board

	4	3	2	1
Q+	8	19	17	12
Q−	16	20	31	19

scattered rates. Of all officers with 20 years of service, 9 percent left the Marine Corps 4 years prior to consideration for colonel, 21 percent left 3 years prior, 31 percent left 2 years prior, and 24 percent left in the year before the board. For 20 years of service, there was an overall marginal rate of 25 percent (given in the righthand column called "total"). The marginal attrition rate at 20 years of service was 6-9 percentage points higher than at 21, 22, and 23 years of service. However, an examination of the numbers in the cells showed them to be statistically independent. That is, there was no reason to presume that years of service or temporal proximity to a selection board had an effect on retention in a statistical sense (see figure 30).

At the same time, whether because of perceptions or for some other reason, there did seem to be a "competitiveness effect." That is, the more competitive (higher-quality) officers seemed more likely to stay.

TEMPORAL PROXIMITY TO BOARDS DID NOT AFFECT THE HOLDING POWER OF EDUCATION

In chapter 3, we discussed the interpretation of the results of analyzing attrition by level of education for the 4 years prior to a colonel selection board. All the data were for 20 years of service and are shown in figure 31 on the next page.

Figure 31

Percentage Attrition Rates by Education and Years Prior to a Board (Number Leavers/Number Present)

Education	Years prior to selection board 4	3	2	1
Less than B.A./B.S.	25	28	31	30
B.A./B.S.	11	18	25	17
M.A./M.S.+	12	16	25	15

Focusing on 20 years of service, while looking at levels of education in combination with occupational specialties, we found the relationships in figure 32. The discussion is in chapter 3. Note that these data are without regard to proximity to a colonel selection board.

Finally, we looked at attrition rates for 20-26 years of service by level of education and by self-sponsored versus

Figure 32

Percentage Attrition Rates by Occupation and Education (Number Leavers/Number Present)

Occupation	Level of education: Less than B.A./B.S.	B.A./B.S.	M.A./M.S.	Overall
Pilot/NFO	33	17	18	20
Infantry	0	19	20	19
All other	100	39	28	33

APPENDIX IV

Figure 33

Percentage Attrition Rates by Education and Years of Service (Number Leavers/Number Present)

Education	Years of service						
	20	21	22	23	24	25	26
Less than B.A./B.S.	29	19	39	24	0	20	13
B.A./B.S.	23	15	15	20	15	5	18
M.A./M.S. +	22	16	17	8	5	0	18
	20	21	22	23	24	25	26
M.A./M.S. + but not SEP	19	9	14	7	0	0	14
SEP/ADP	27	26	21	18	10	0	25

government-sponsored graduate education. These data, shown in figure 33, are without regard to temporal proximity to a colonel selection board and are discussed in chapter 3.

APPENDIX V

MARINE CORPS-SPONSORED EDUCATION

We looked at two types of military-sponsored education that we called "graduate" and "professional" education. In order to indicate the distinction between them, we have extracted material from Defense Manpower, a military textbook.[1] Notice that what we have called graduate and professional education, the book's authors refer to as "graduate" and "military" education.

> "Professional training is concerned with educational goals in areas such as engineering, business and management, medicine, and military science, and it is accomplished at both military and civilian institutions. It includes degree completion education, non-degree professional development courses, military education, graduate education, and medical training.
>
> "Professional development through military education is a process that should continue through an officer's career. Military education is provided at the graduate level by both intermediate and senior professional schools to selected career professionals of all Services. Each type of school provides officers with the formal military education required of military leaders at different levels of career development."

On January 1, 1974, there were among the male officers 2,965 majors, 1,516 lieutenant colonels, and 626 colonels on active duty in the Marine Corps. In fiscal year 1974, 63 Marines attended senior professional schools and 124 attended intermediate professional schools.

> "Middle-level officers attend the intermediate professional schools--the Air Force Command and Staff College, the Army Command and General Staff College, the Marine Corps Command and Staff College, and the Navy Command and Staff College. These institutions are attended for preparation for positions on major unit staffs (in the case of the Service colleges) or on joint commands (in the case of the Armed Forces Staff College).
>
> "The highest echelon of Service schools, the senior Service colleges, offers broad educational programs . . . . Each college follows a broad curriculum of integrated courses, focusing on such areas as basic national interests, possible threats, research and development, techniques of military operation, planning and programming systems, and the problems of devising military programs for the future.

---

[1]Stanley L. Falk, E. M. Gershater, Glenn L. Simpson, Defense Manpower (Washington, D.C.: National Defense University, 1981); the quotations in this appendix are from pages 63-66.

"The system of military schools is augmented by the practice of sending officers to civilian graduate schools for specific programs. A wide variety of positions in all Services--academy instructors, members of special weapons groups, research and development officers, departmental staffs, and professors of military science--are designated as requiring advanced civilian degrees. Officers selected for these assignments are sent to graduate schools to take the courses and programs needed to prepare them for the positions.

"Graduate education includes all the advanced degree programs of the military services. Although most of these programs are conducted at civilian institutions, two military institutions--the Navy Postgraduate School and the Air Force Institute of Technology--also award advanced degrees.

"Depending on the particular course of study, they may be provided with intensive views of pertinent history, an understanding of national policies and goals, an analytical background for decisionmaking, theoretical bases for technical management and project development, and the operational and economic bases for tactical versus strategic exchanges."

(973547)

29768

AN EQUAL OPPORTUNITY EMPLOYER

UNITED STATES
GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE,$300

POSTAGE AND FEES PAID
U. S. GENERAL ACCOUNTING OFFICE

THIRD CLASS