The Civil Service Workforce After Strategic Sourcing

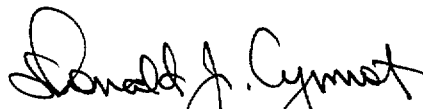Anthony R. DiTrapani
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Contents

Summary

In this assessment of the Navy's civilian workforce, we look at trends over the past decade and project changes to the workforce in the decade to come.

Based on our review, we found that the Navy's civilian workforce is similar to that of the government civil service and the other Services in terms of education, age, and years of government service.

In regard to diversity, the Navy's civil service workforce is similar to that of the other Services, but it lags the total government civil service workforce. Despite an increase in minority representation among new Navy civilian employees, minority representation in the overall workforce may decline in the future because positions undergoing strategic sourcing tend to be positions with higher-than-average minority representation.

The average grade level of the Navy civilian workforce is increasing, but primarily as a result of changes in the mix of work and occupations and how work is performed, not as a result of more rapid grade raises for individuals. As strategic sourcing continues, the average grade level will continue to increase, because the jobs most likely to be eliminated will be lower grade jobs.

The average age of the Navy's workforce has increased 5 years over the past decade. Although an aging workforce will be a more costly workforce, research shows that it will not necessarily be a less productive one if a policy of continuous learning is pursued.

New employees joining the workforce are older than is generally believed, averaging 34.4 years of age. Nearly 50 percent of new employees have prior service with the government, either in the military or in government agencies, averaging nearly 10 years. Advertising, recruiting, and training initiatives need to recognize this demographic with targeted programs.

The Navy does not have a data system that provides adequate information for management oversight. The data system currently in use does not provide information on the skills, training, or past work experience of individual workers. We recommend that the Navy develop and maintain such a database.

Training expenditures for most of the Navy commands for which we obtained data were less than 1.4 percent of payroll. This is below the averages for other large government organizations and substantially lower than SECNAV guidance of 4.1 percent, a level we think is appropriate for an effective training, retraining, and education program.

The average time to recruit new employees from outside the Navy is nearly 160 days, compared with 7 to 14 days in the private sector—an unacceptable variance. Unless fundamental changes are made to current recruiting laws and regulations, the Navy will continue to lag the private sector, regardless of what internal procedural improvements might be implemented. Therefore, the Navy should consider legislative proposals that would provide more authority and flexibility to managers. In the meantime, the Navy should expand the use of co-op programs to improve opportunities to hire new college graduates, and increase training to improve retention and motivation and get the most out of the current workforce.

The positions identified for strategic sourcing assessments include a large number of positions in the human resources (HR) community. Because it would be disruptive to conduct the analysis at the same time that the HR community is needed to implement the results of strategic sourcing analysis of other occupations, we recommend that HR strategic sourcing be delayed until most other strategic sourcing personnel actions are complete.

The Navy should create "occupational leaders" for major occupational groups, similar to the Defense Acquisition Workforce Improvement Act (DAWIA) program for acquisition professionals, to ensure that consistent recruiting and training standards are created and enforced for each discipline.

Introduction and background

In June 1999, the Navy's Five Year Development Plan included roughly 80,000 civilian positions as part of its "competitive sourcing initiative." As a result of competitive sourcing, half or more of the positions involved with commercial activities (Navy activities that are similar to activities in industry) could be removed from the civil service roles either because of outsourcing or internal efficiencies. Because the competitions were planned, for the most part, as isolated actions, the broader consequences of these competitions for the overall civil service workforce were not fully understood. For this reason, the Assistant Deputy Chief of Naval Operations (N1B) asked us to develop some guidelines that would help decision-makers plan for the consequences of the Navy's competitive sourcing initiative. Specifically, the request was to (a) establish a baseline of the current and past civil service workforce, and project changes that could result from the competitive sourcing initiative; (b) benchmark the Navy system and its projected shape with other civil service systems; (c) examine alternative approaches for dealing with the evolution; and (d) develop proposals, if needed, that would help the Navy adjust to the evolving size and shape of the civil service workforce.

Recently, the Navy's policy regarding competitive sourcing has evolved into "strategic sourcing," a broader initiative covering over 91,000 positions, that not only evaluates and competes commercial activities in the Navy, but also calls for the "regionalization" of some functions common to many activities in one geographical area, conducting functionality assessments of major noncommercial activities, and reviewing "buying habits" to identify additional efficiencies. This paper addresses the strategic sourcing initiative and its potential impact on the Navy's civilian workforce.

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Demographics of the Navy's civilian workforce

The workforce today

The Navy civil service workforce consists of 172,445 full-time permanent and temporary employees, of which 65 percent are in the GM/GS pay system, and 35 percent are in wage-grade, mariner, police, security guard, and fire protection/prevention pay systems.[1] The typical full-time civilian in the Navy in 1999 is 46 years of age, with 17 years of federal service. The workforce is 32 percent female and 76 percent white-collar, and 28.1 percent are minorities, including 17 percent Blacks and Hispanics. There are 313 members of the senior executive service (SES). The average grade level of the non-wage-grade employees is 9.9, distributed by age and grade as shown in figure 1. Similar distributions for each occupation in the white-collar workforce are in appendix A.

In June 1999, there were 5,900 temporary employees, representing 3.4 percent of the full-time workforce. Although 60 percent of the temporary employees are white-collar and 40 percent are blue-collar, only about 3 percent of the total white-collar workforce and 4 percent of the blue-collar workforce are temporary.

Navy civilians are employed worldwide—full-time permanent U.S. civilians work in 80 cities in 35 foreign countries.[2] In the United States, Navy civilians work in 408 cities, although they are concentrated in just a few. In fact, more than half the white-collar jobs are located in ten U.S. metropolitan areas. (See figure 2.)

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1. Unless otherwise indicated, all information in this report is based on Defense Civilian Personnel Data System (DCPDS) data, 1989/1990 through June 1999. Data provided exclude Marine Corps civilians, direct- and indirect-hire foreign nationals, and nonappropriated fund (NAF) employees.

2. Includes U.S. territories.

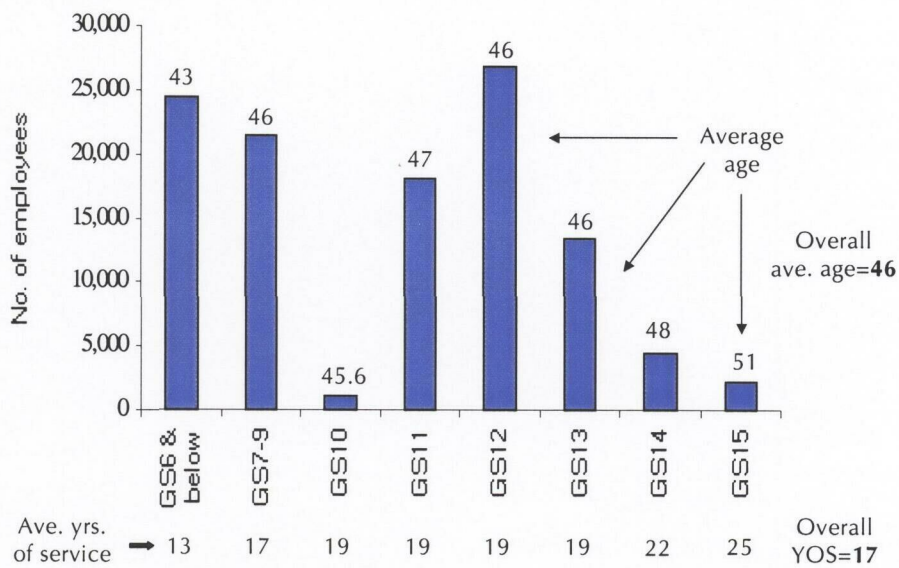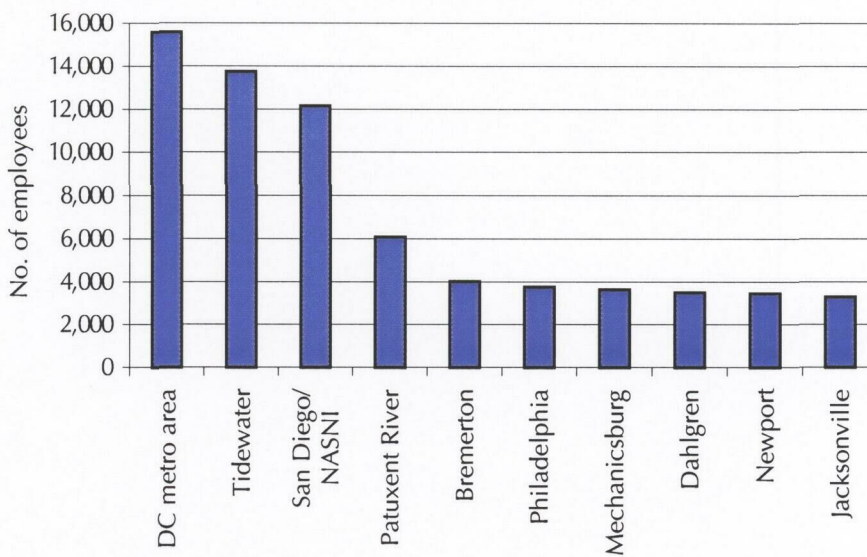Figure 1.   GM/GS employee distribution

Figure 2.   Navy white-collar civilian job locations (cities)

Among the states, Virginia and California dominate (figure 3).

Figure 3.   Navy civilian job locations (states)
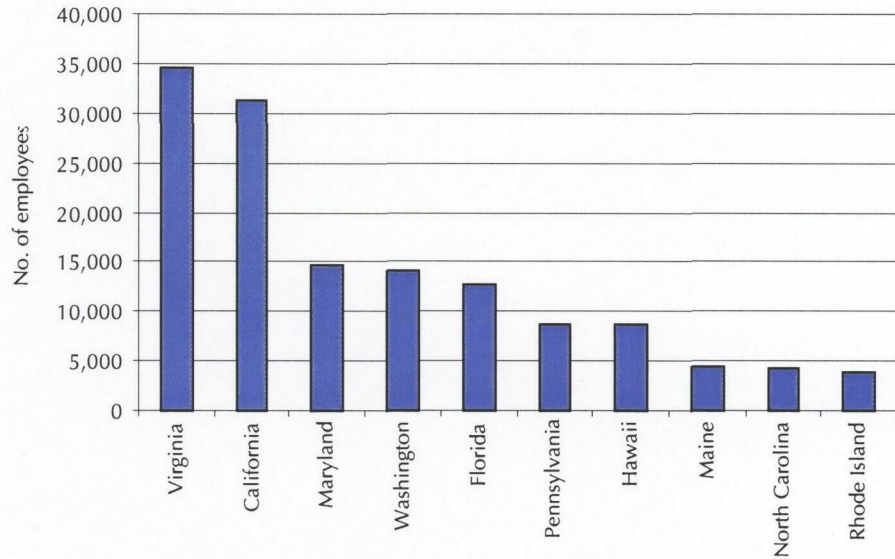
There are more engineers in the Navy civilian workforce than any other occupation.[3] Table 1 summarizes the top ten civilian occupations in the Navy, listing average years of service and average age for each. Note that each of these "occupations" is actually a grouping of different types of jobs within one occupational series. For example, the "Medical & Health" occupational series includes 49 different types of jobs, ranging from physicians, nurses, medical technicians, and pharmacists, to hospital housekeeping managers, health system specialists, and medical clerks. (Appendix B lists the job types included in all occupational series.)

Some of these occupational series, such as the engineering series and math and sciences series, include jobs that are predominately

3.   Electronics engineers (9,678) are the most prevalent within this category, followed by mechanical (5,003), general (3,151), aerospace (1,547), nuclear (1,337), environmental (1,169), electrical (1,134), industrial (513), computer (446), and materials engineers (300).

professional (e.g., they require a college degree), but most do not. To gain a better understanding of the characteristics of each series, the human resources community throughout the government commonly sorts positions by so-called PATCOB functional designators: professional, administrative, technical, clerical, "other," and blue-collar, where the blue-collar designator generally subsumes all wage-grade employees, and the remaining PATCO designators are distributed among the GS/GM occupations. Figure 4 shows an example of this distribution for the top ten Navy occupations.

Table 1. Top ten occupations, age and years of federal service

	Members	Average age	Average years of service
Engineer/Architect	36,762	44	18
Program Analysis/Administration	32,413	45	17
Business and Industry	9,651	46	19
Financial Administration	7,541	46	17
Supply	4,973	48	19
Medical and Health	4,271	46	12
Physical Science	4,045	45	16
Personnel Management	3,885	45	16
Education	3,499	45	12
Math and Statistics	3,053	42	14

Because both methods of categorizing positions provide insight into the shape of the workforce, we will present much of the data in this report in both PATCOB and occupational series format. Figure 5 shows the overall distribution of the Navy workforce by functional category.

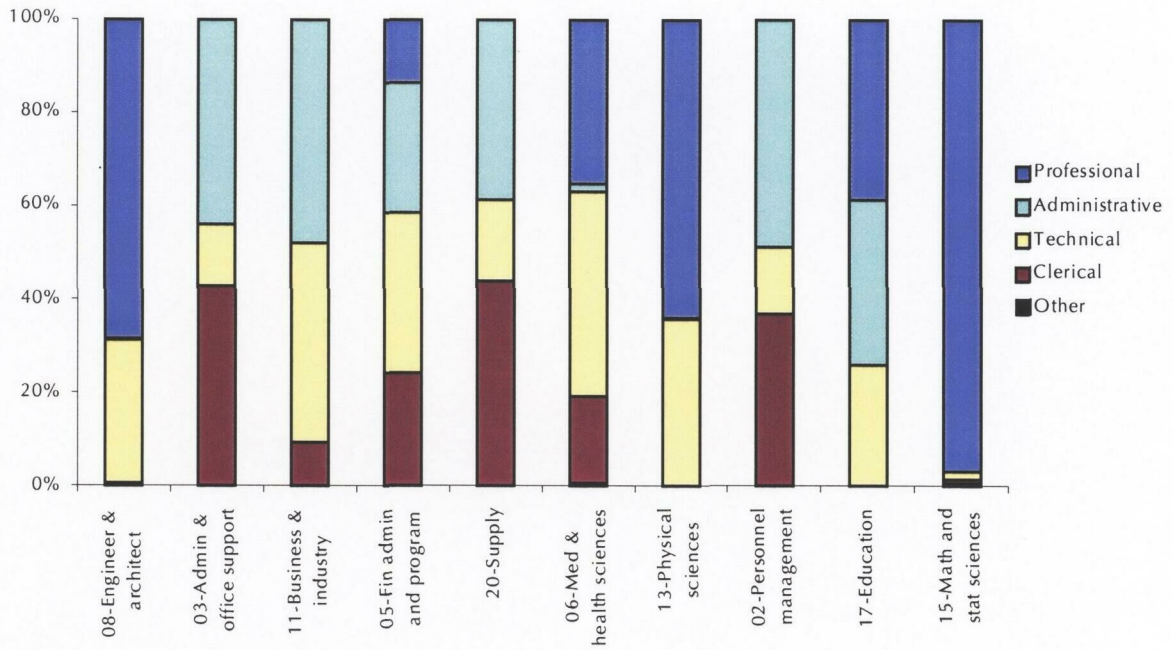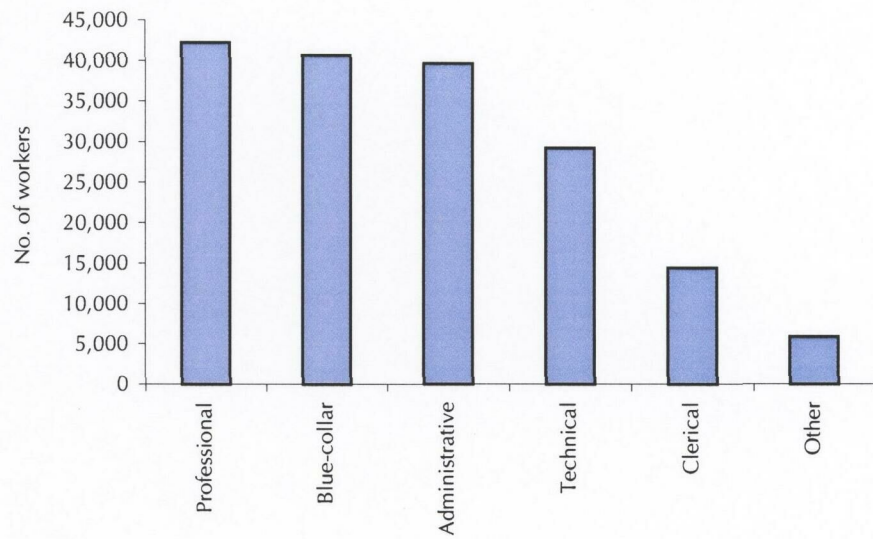Figure 4. Function distribution among top ten occupations

Figure 5. Distribution of workforce by function

Workforce trends

Changes to size and mix

The current civilian workforce has dropped in size by 43 percent since 1989, as the Navy's military forces downsized throughout the decade. Reduced numbers of operating ships and aircraft mean that fewer support and maintenance personnel are needed at headquarters, supply centers, and maintenance activities; less procurement of new equipment means that fewer contracting and program management personnel are needed. All of these reductions have caused large-scale elimination of personnel support jobs, especially those involving clerical, administrative, and human resources staffs.

In addition to the overall reductions dictated by reductions in fleet-related workload, many jobs have been eliminated because of outsourcing of functions that have been determined to be not "inherently governmental," or because of technology changes in the workplace that have reduced the need for secretarial support (most notably the rapidly expanding use of PCs, e-mail, and voice-mail). These changes have had the greatest effect on the clerical and blue-collar functions, and the supply and financial administration/program occupational series. (See figures 6 and 7, respectively.)

Figure 6.   Population changes of functional groups, 1990–1999
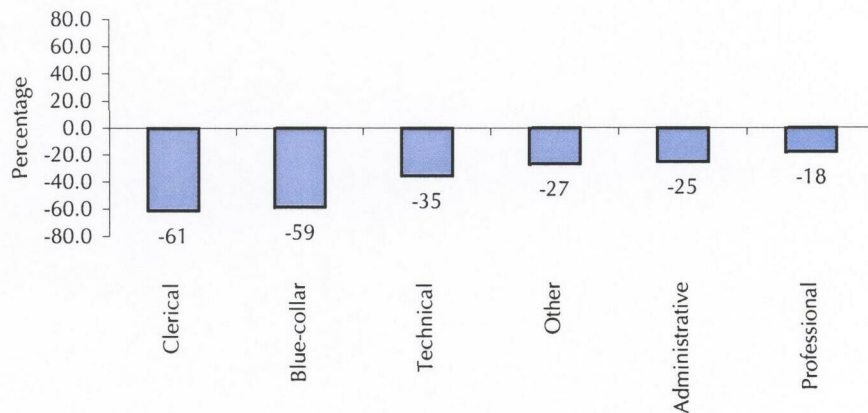
Figure 7. Population changes of top ten occupations, 1990–1999
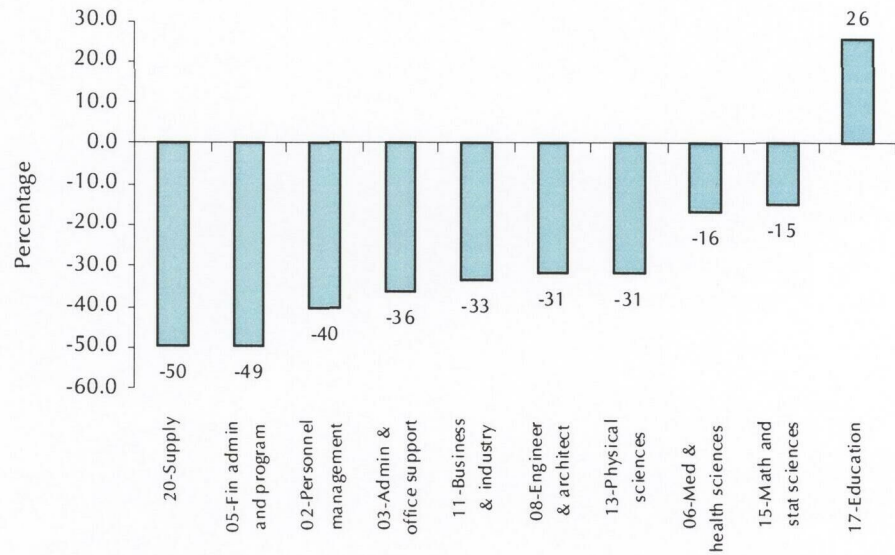
But these figures tell just part of the story. Of equal significance is the amount of "churning" that takes place in each occupation as the workforce downsizes. Figure 8 shows that in some occupations, such as the education and medical occupational series, the total numbers have changed little (losses and new employees are nearly equal), but high turnover has resulted in a high percentage of new personnel. This has implications for training, and also for the HR community because, while the Navy downsized by roughly 112,000 positions from 1990 to 1998, more than 377,000 personnel actions (244,000 separations and 133,000 new hires) were required over the same period.

Figure 9 shows that the functional groups with the most turnover are the clerical employees, and guards and fire protection personnel, which make up the majority of the "other" category.

Increases to average grade level

As the downsizing has continued and clerical, administrative, and blue-collar workers have left, the workforce has become increasingly white-collar, and the average grade level of the white-collar workers has increased from 9.1 to 9.9 (figures 10 and 11).

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Figure 8.   Top ten occupations, losses vs. new employees, 1990–1998
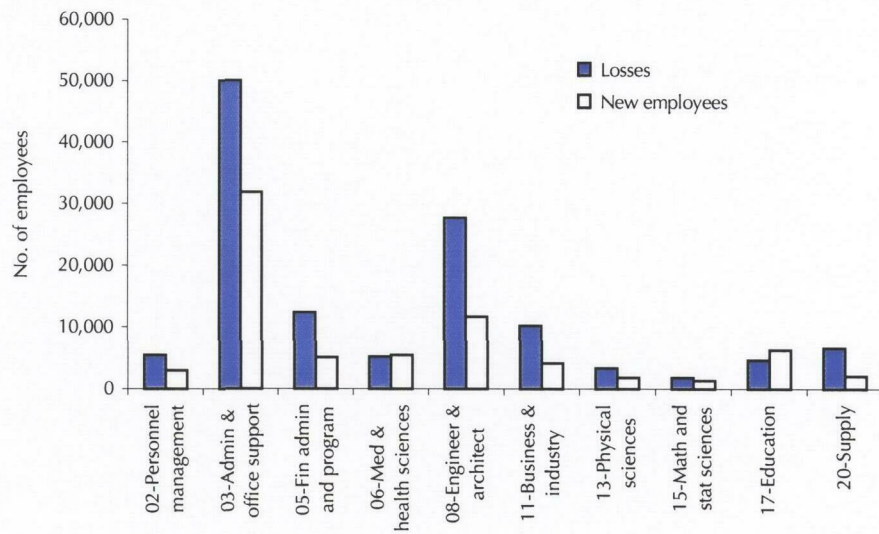
Figure 9.   Losses vs. new employees, 1990-1998, by function
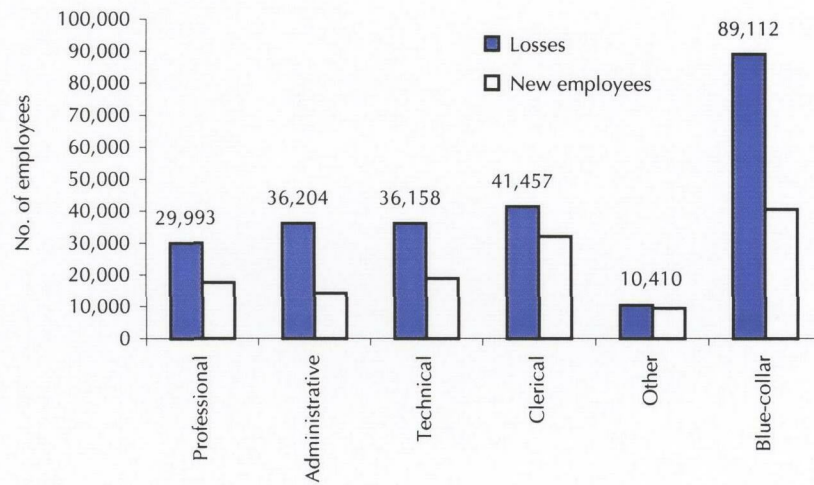
Figure 10. The Navy workforce is increasingly white-collar
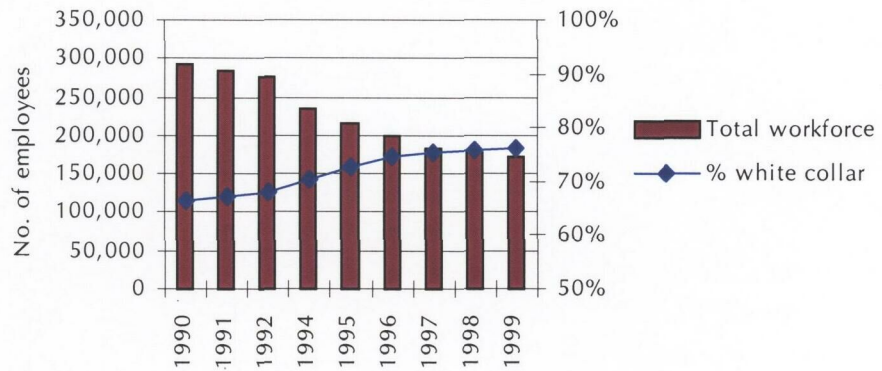
Figure 11. GS/GM average grade level, 1989–1999
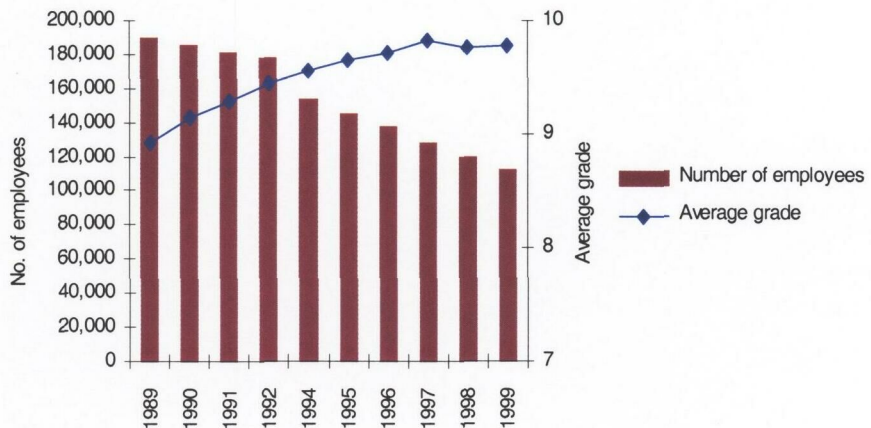
The Office of Personnel Management (OPM) and The Office of the Secretary of Defense monitor average grade levels, and increased average grades are cited by some as evidence of "grade creep," the gradual increase of grade levels (and pay) over time for the same job. Average grade levels have been increasing throughout the federal workforce (figure 12), prompting some agencies, including the Navy, to attempt to "control" average grade levels with periodic promotion "freezes" (especially at the levels of GS-13 and above). Often this is done by requiring that upper management approve all promotions to GS-13 and above.

Figure 12. Average grade for all federal General Schedule Employees[a]
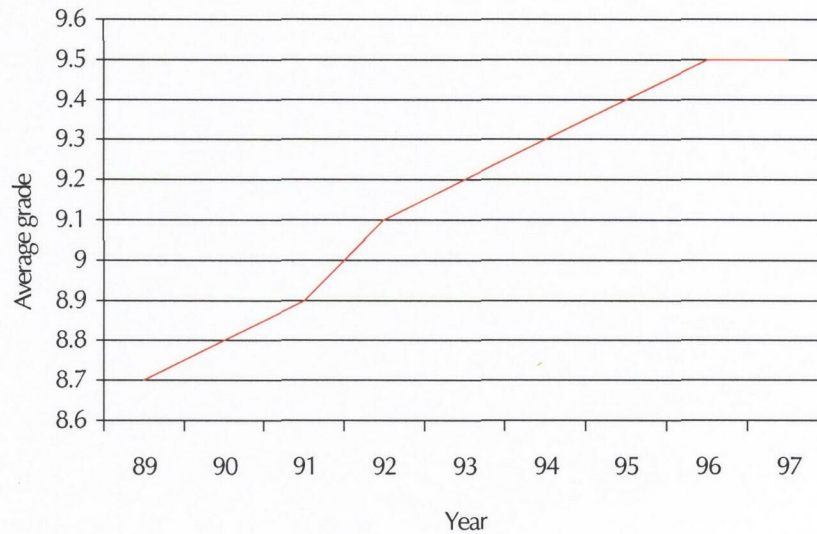
We believe that average grade level is not an appropriate metric for control purposes, nor should an increase in average grade level in a command or agency necessarily be viewed negatively. A more appropriate metric for management visibility is total payroll for a given function or functions. Take, for example, the manager who chooses to redesign a process so that it can be accomplished by one GS-9 rather than two GS-7s. The manager should be lauded for his or her creativity because the payroll for the function drops from about $55,000 to $34,000.[4] Yet, the average grade for the function has increased from GS-7 to GS-9!

We examined trends in how long it takes the average employee to be promoted to the GS-12, 13, 14, and 15 levels (how many years of federal service before promotion to these grades) to determine whether grade raises have, as some have contended, been easier to obtain over the past decade. If this hypothesis is true, grade raises should be occurring, on average, earlier in careers. However, we found (figure 13) that the number of years of federal service before

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4. January 1999 salary table for locality pay area of Washington-Baltimore, Maryland, Virginia, and West Virginia.

promotion has remained unchanged for GS-14s since 1990, but has increased for the other grades, most significantly for GS-12 (4 years) and GS-15 (3 years).

Figure 13. Average years of service to promotion
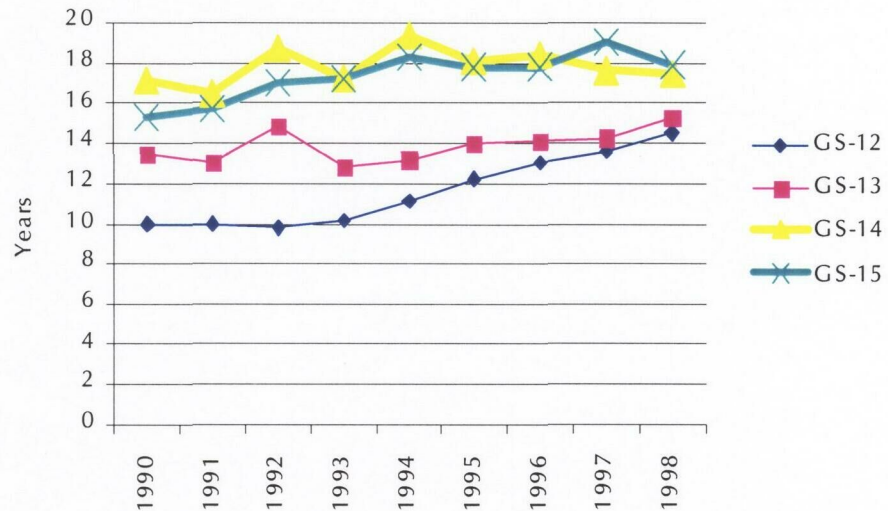
Because the largest portion of the reductions since 1990 were in the lower graded clerical and administrative positions (figures 6 and 7), it is likely that the Navy's average grade increase since that time is primarily attributable to shifts in the mix of specialties in the Navy due to changes in certain functions, not "grade creep." To quantify this, we calculated the average grade for the total workforce in 1999 using the average grade of each PATCO category in 1999 *but the mix of PATCO functions that existed in 1990.* Using this method, we negate the effects of changes in the mix of the workforce, and measure only changes to grade levels within each PATCO category. The result is that, when changes to workforce mix are taken into account, the average grade level rose from 9.1 in 1990 to only 9.4 in 1999. Because times to promotion increased substantially in the 1990s, the remaining incremental increase to average grade is most likely attributable to changes in how work is being done (one GS-9 for two GS-7s, for example), not more frequent grade raises. This grade level increase varies among the top ten occupations, as shown in figures 14 and 15, and as detailed in appendix C.

Figure 14. Average grade for top five occupations

Legend:
- 08-Engineer & architect
- 03-Admin & office support
- 11-Business & industry
- 05-Fin admin and program
- 20-Supply
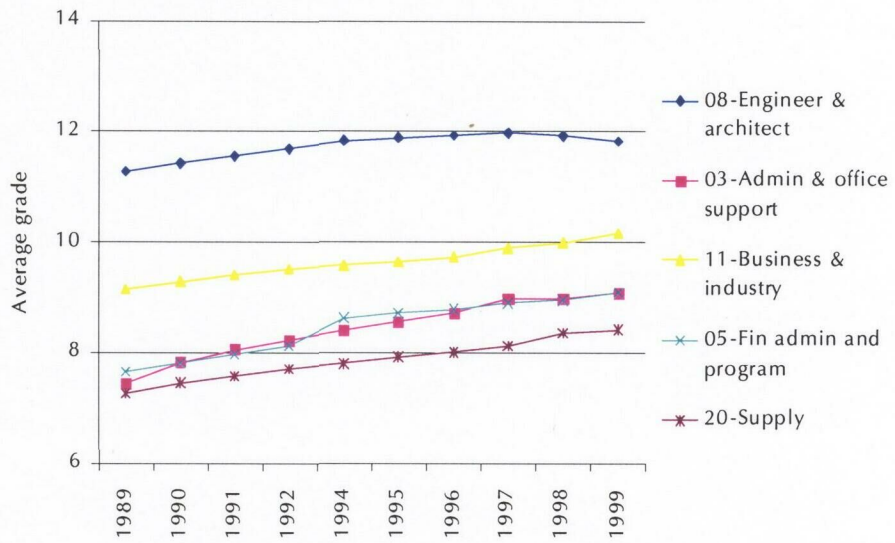
Figure 15. Average grade for 6th through 10th occupations

Legend:
- 06-Med & health sciences
- 13-Physical sciences
- 02-Personnel management
- 17-Education
- 15-Math and stat sciences
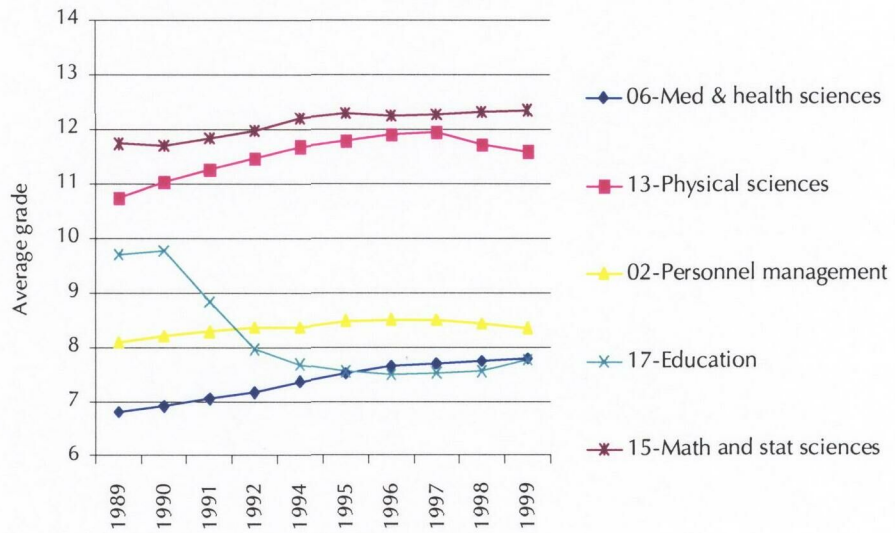
Education levels

The percentage of wage-grade employees with high school diplomas but no college degrees has increased slightly since 1990, from

87.5 percent to 90.6 percent. And, although no wage-grade jobs require a college education, 2.7 percent of wage-grade employees have degrees now, compared to 2.3 percent in 1990 (figure 16).[5] For non-wage-grade employees, the metric of interest is the Bachelor's degree, rather than the high school diploma. Non-wage-grade employees with a Bachelor's degree have increased from 25.8 percent of the workforce in 1989 to 27.2 percent in 1999, and those with advanced degrees increased from 12.7 to 15.6 percent (figure 17).

Figure 16. Education of wage-grade employees
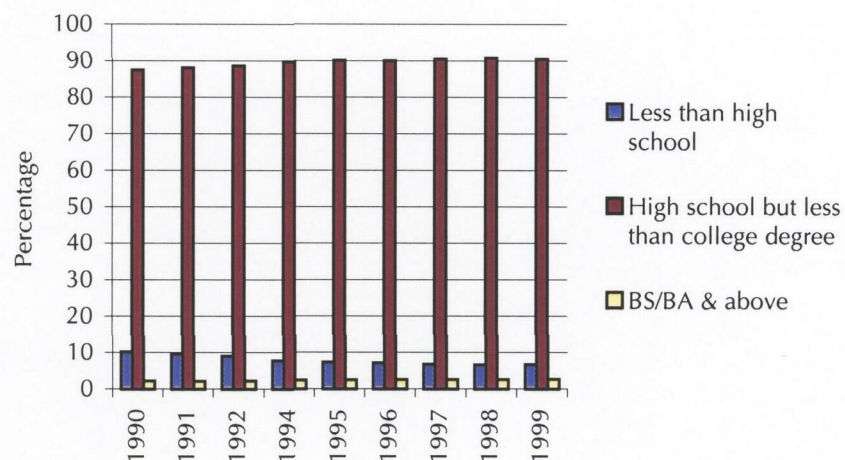
Although these data indicate that the workforce is gradually becoming more educated, this is less a result of employment and recruiting practices than of downsizing—when more professional positions were retained than clerical and administrative positions.

One way to measure how well the Navy is doing in attracting better educated white-collar personnel, while avoiding the effects of a changing occupational mix among new hires, is to review how many personnel with college degrees are being hired for non-wage-grade

5. These statistics generally understate the level of educational achievement because education gained after an employee is hired is often not captured in the database.

positions that do not require degrees (such as personnel specialists, or program and budget analysts). For such positions, 19.6 percent of those hired had Bachelor degrees or better in 1990, whereas only 17.4 percent did in 1998 (figure 18). This measure appears to indicate at least a slight decline in our ability to attract higher quality white-collar employees, and suggests that the decline may continue in the future.

Figure 17. Education of non-wage-grade employees
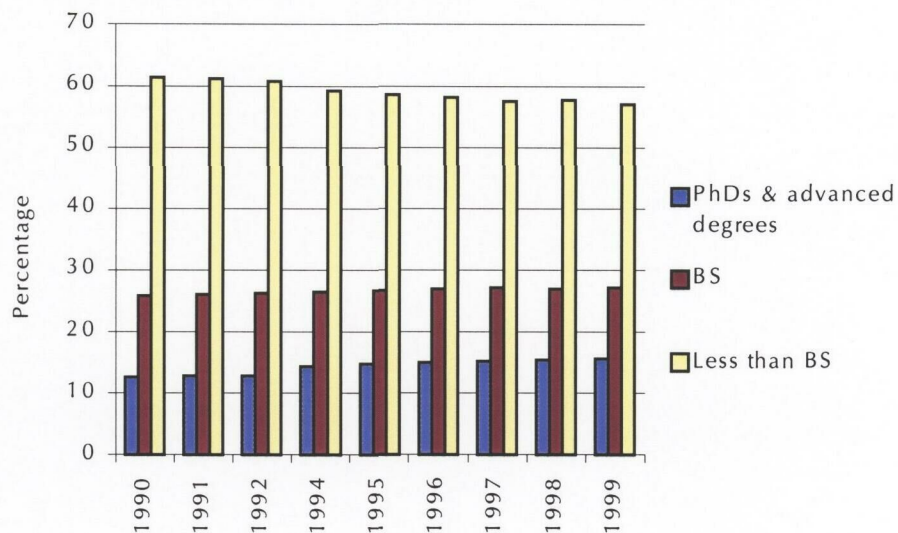
Figure 18. Education of new employees in non-blue-collar, nonprofessional jobs
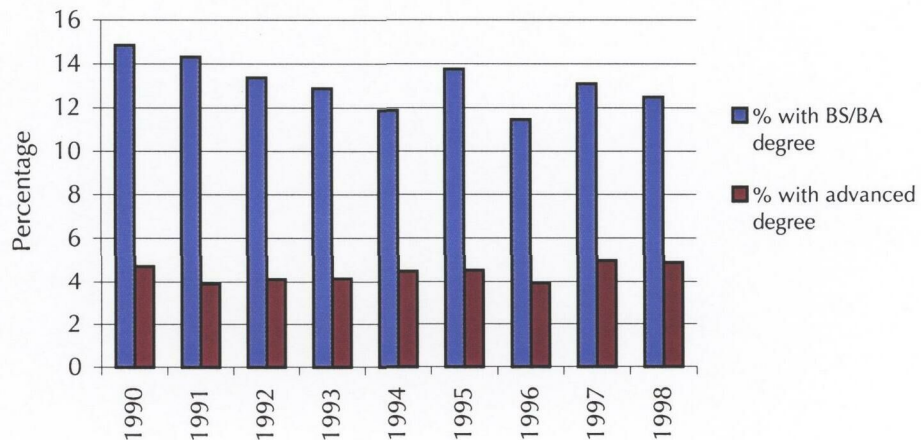
For new *wage-grade* employees, the education level has increased slightly over the past decade, with about 93 percent of new hires having high school diplomas and 2.4 percent having Bachelor's degrees, compared to 90 percent and 1.5 percent, respectively, in 1990 (figure 19).

Figure 19. Education of new wage-grade employees
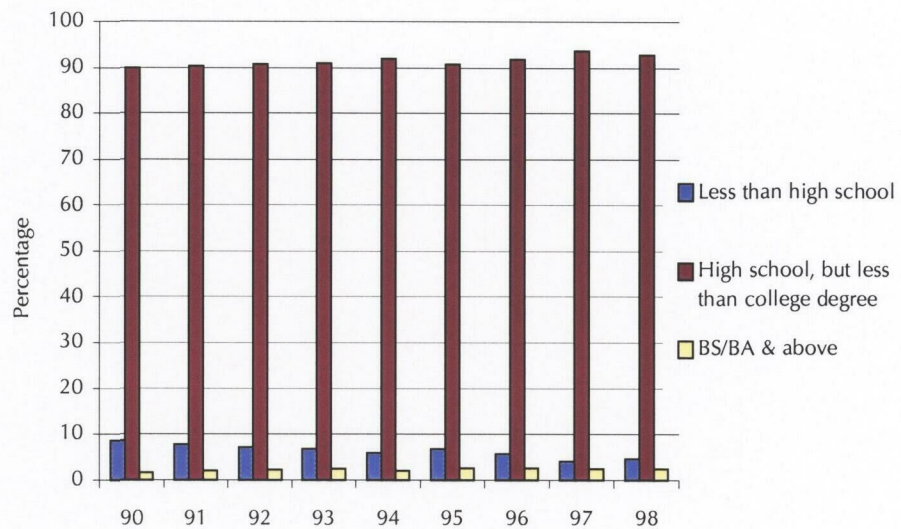
Diversity in the workforce

The percentage of minorities in the workforce has increased only slightly since 1989, from 27.2 percent to 28.1 percent (figure 20).

Note that a significant upward trend was reversed between 1995 and 1997, the period when blue-collar workers and clerical/administrative positions (the positions with the higher percentages of minorities) were being cut. Although the percentage of minorities among *new* employees has consistently remained above 32 percent every year of the decade, with some years approaching 39 percent (figure 21), losses over the decade for all reasons (downsizing, resignations, retirements) also were high (figure 22). In effect, the higher percentage of minorities leaving the workforce has offset the higher percentage of minorities among new employees, so that the change in the workforce overall has been small.

Figure 20. Minorities as a percentage of total workforce, 1989–1990
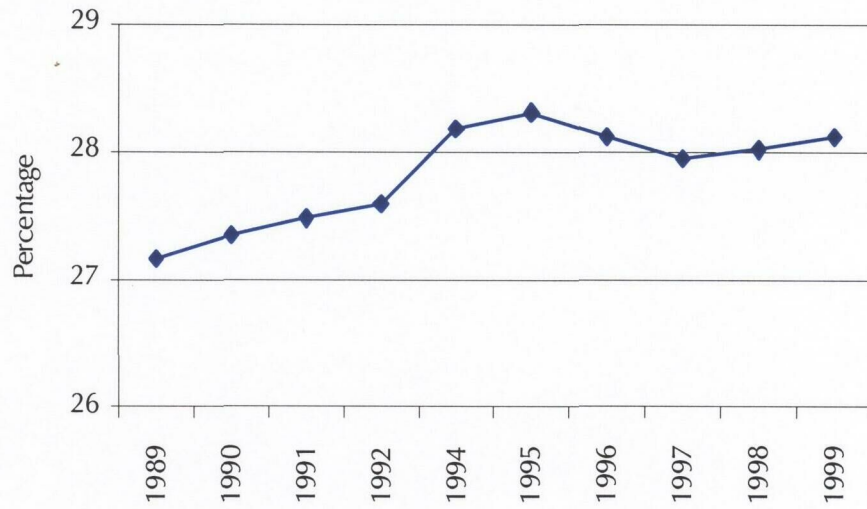
Figure 21. Minorities and females as a percentage of new employees
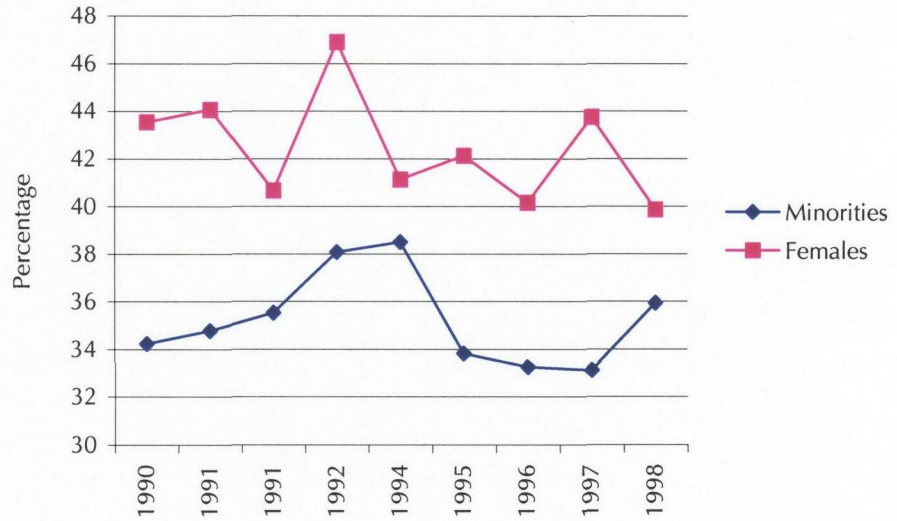
Figure 22. Minorities as a percentage of all losses
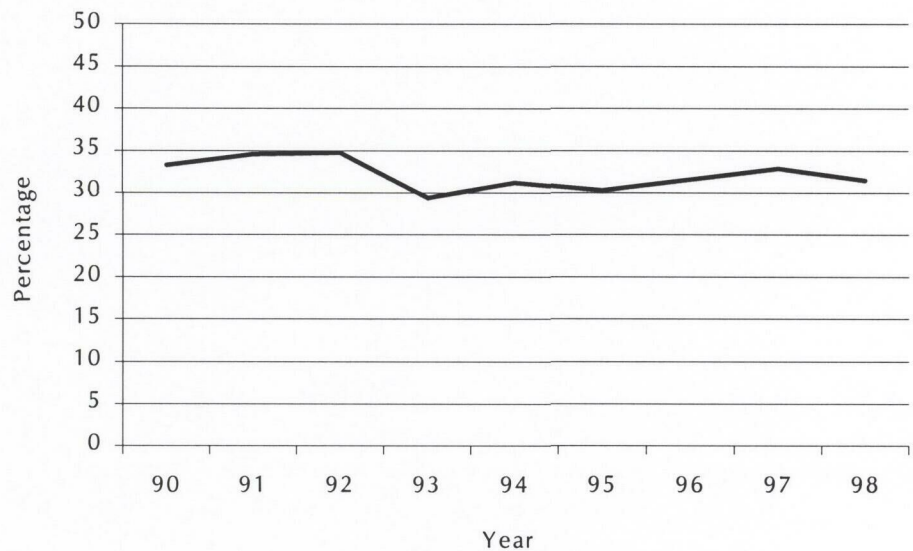
However, although the overall percentage of minorities in the Navy workforce has risen less than 1 percent over the past decade, minorities have made significant advances in areas offering higher pay. For example, the percentage of minorities in the professional and technical occupations has increased from 21 percent in 1989 to 24 percent in 1999 (figure 23). Minority and female representation among other functional groups has remained relatively constant over the past decade, as shown in appendix D. Figure 24 shows the current minority and female composition of all functional groups.

The aging workforce

Much has been made of the fact that the Navy has an "aging workforce." Indeed, the average age of a Navy employee is now 46 years, up from 41 years in 1989. The workforce is aging for nearly all occupations, although some occupations tend to retain more older workers than others (figures 25 and 26).

Some occupations tend to attract younger workers, whereas others consistently attract and retain older workers. Four of the top ten occupations—engineers, physical sciences, administrative and office support, and math and statistical sciences—generally attract new

Figure 23. Minorities in professional and technical occupations
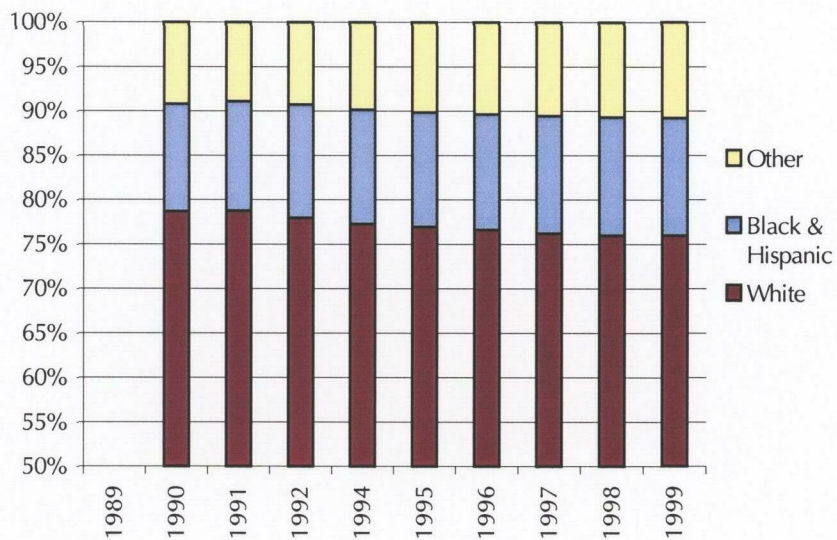
Figure 24. Female and minority representation by function
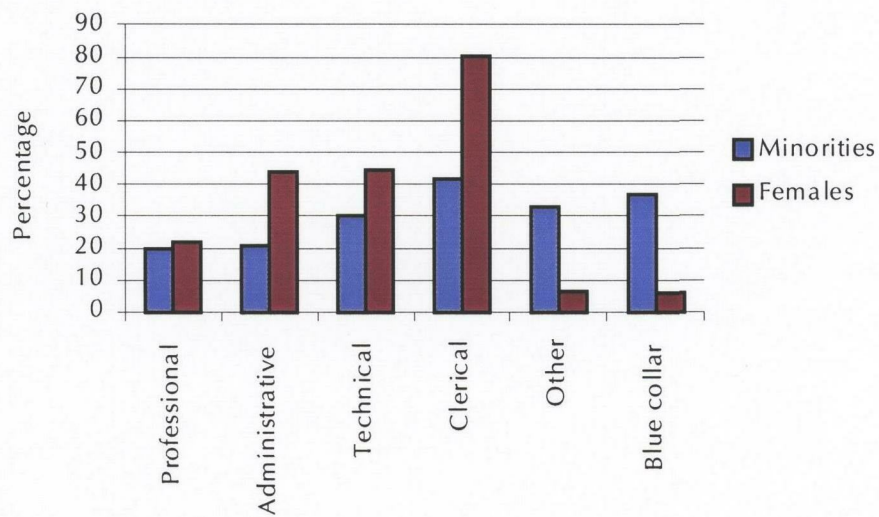
Figure 25. Average age of top five occupations
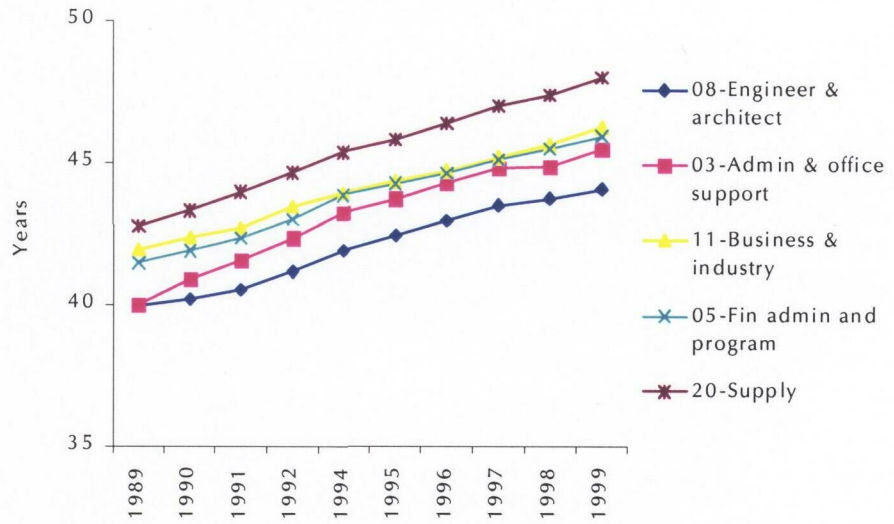
Figure 26. Average age of 6th through 10th occupations
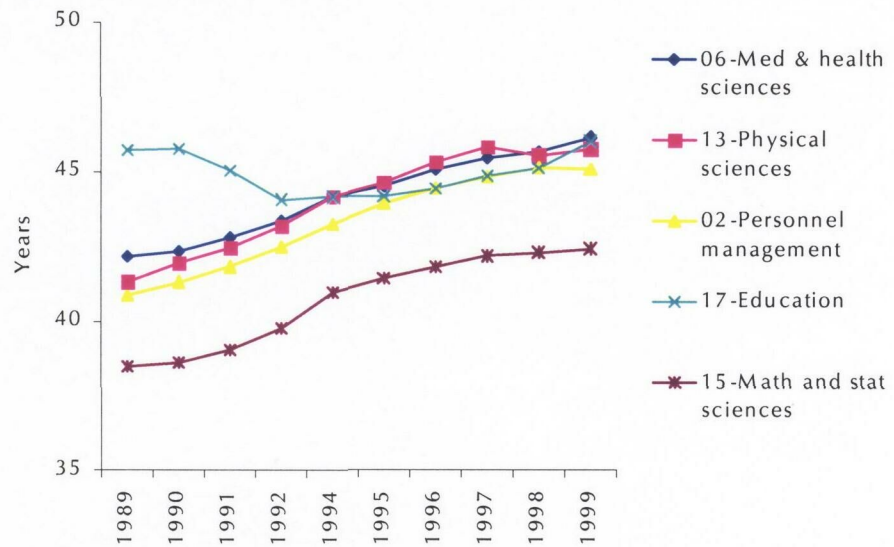
employees who are younger than the Navy average for new hires (figure 27). The nature of these occupations and the recruiting practices associated with them may account for this fact. Many of the administrative/clerical occupations hire personnel directly out of high school, and the occupational series dominated by professionals tend to recruit and hire recent college graduates.

Figure 27. Average age of new employees, top ten occupations
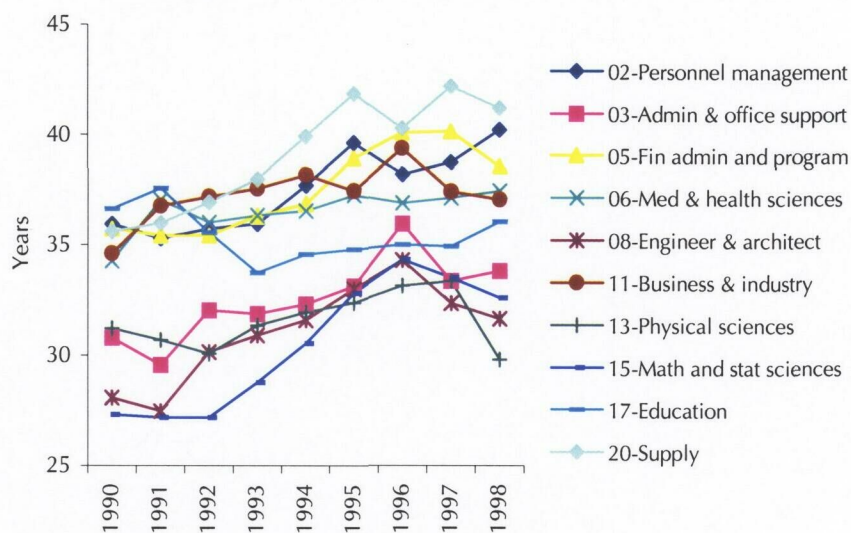
Some of the occupational series with higher average ages—notably supply, human resources, and business (contracting)—tend to hire retired military personnel or specialists from other agencies, thus raising the average age of their new hires. New employees that have prior government service[6] now represent about half of all new employees, and during the government's downsizing of the mid-1990s, they represented considerably more than that (figure 28). New employees with prior service, hired over the past decade, averaged about 9 to 10 years of prior government service when hired.

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6. Prior government service incudes former Navy civil servants, service at other U.S. government agencies, and former military service.

Figure 28. New employees with prior federal service
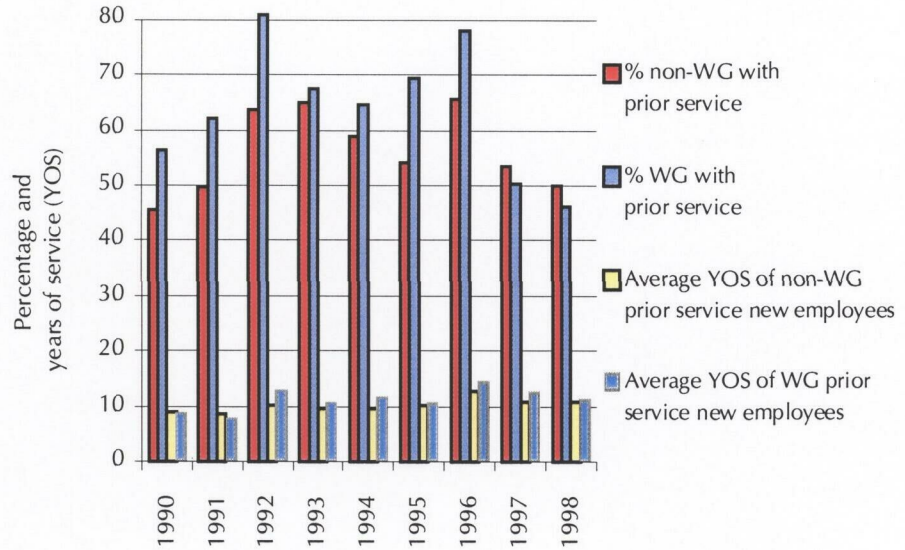
We were surprised by the high percentage of new employees who had prior government service,[7] and tried to determine the relative skill and experience level of these employees by comparing the average grade at which permanent and temporary new employees joined the Navy to the average grade of the Navy functional group that they joined. The results, shown in figures 29 and 30, indicate that new employees with prior government service who are hired as either permanent or temporary employees tend to be hired at grade levels lower than the existing average grade level for their function. Clearly, the Navy is acquiring few middle and upper management personnel from outside the Navy, and therefore it must be "growing its own." Thus, training and leadership programs must be developed to ensure that the workforce of the future is capable and effective. This will be addressed later in this paper.

The average age of the workforce is increasing overall, despite a relatively large number of retirements in the mid-1990s (the downsizing

7. The database does not distinguish among former Navy civilians who have resigned and are re-employed by the Navy, transferees from other federal government agencies, or former military personnel.

Figure 29. Grade difference between new permanent employees with
prior service, and all full-time incumbents
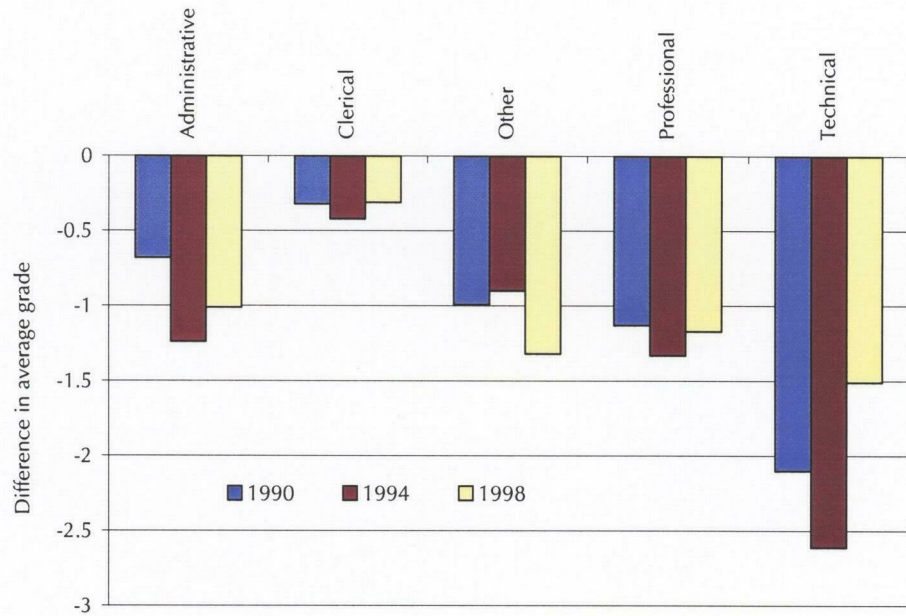
Figure 30. Grade difference between new temporary employees with
prior service, and all full-time incumbents
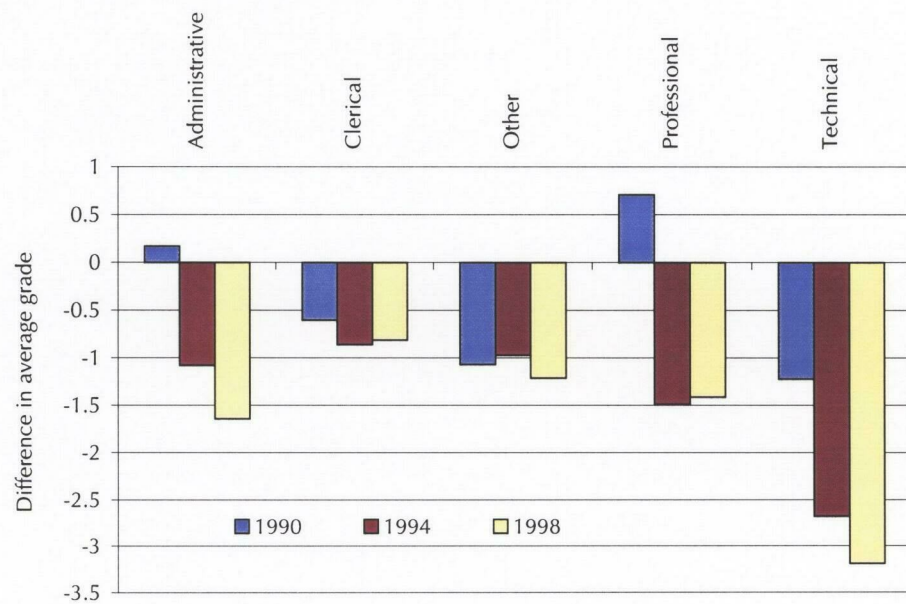
years) because the people the Navy is hiring are older than in prior years. This is primarily the result of an increasing number of transfers of experienced personnel from other agencies. However, even employees who are hired with no prior government experience, many of whom are directly out of school, are more than 2 years older than they were a decade ago most probably because college students today typically take more than 4 years to graduate (figure 31).

Figure 31. Average age of new employees, with and without prior government service

What is the significance?

But is an aging workforce a problem? Is it bad news, good news, or of no consequence? Certainly, an aging workforce means a more experienced workforce, which currently has a median and an average of 17 years of government service (figure 32).[8] This is markedly different from the U.S. workforce as a whole. As of February 1998, male workers had a median tenure with their employers of only 3.8 years; the tenure of female employees was slightly lower [1].

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8. Because the Navy hires a considerable number of employees with prior government service (figure 28), much of this may be time at other agencies.

Figure 32. Average years of service
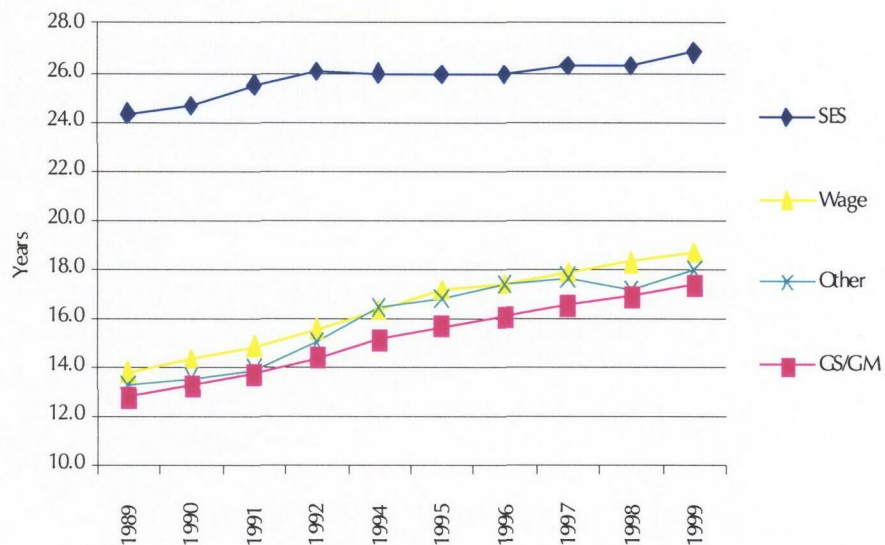
Although quite different from the private sector, the Navy workforce's length of federal service is not inconsistent with that of the other military services, our benchmark agencies (NASA and the State Department),[9] or the federal government overall, nor is the Navy's average age significantly different from the others (figure 33).

An aging, but more experienced, workforce raises four major issues:

- Is an aging workforce more costly, or less costly?

- What effect does an aging workforce have on productivity?

- Does an aging workforce portend a "brain drain" in the near future as retirement eligibility nears?

- What are the implications for training and recruiting programs?

9. To compare the Navy with specific agencies outside the DOD, we selected two "benchmark agencies" that are similar in some ways to the Navy. We chose NASA because of its highly technical products and workforce, and the State Department civil service workforce (excluding the foreign service) because of its worldwide operations and the fact that its civil service workforce operates somewhat in the shadow of the more dominant foreign service (much as the Navy's civil service is generally subordinate to the military).

Figure 33. Comparison of age and years of service
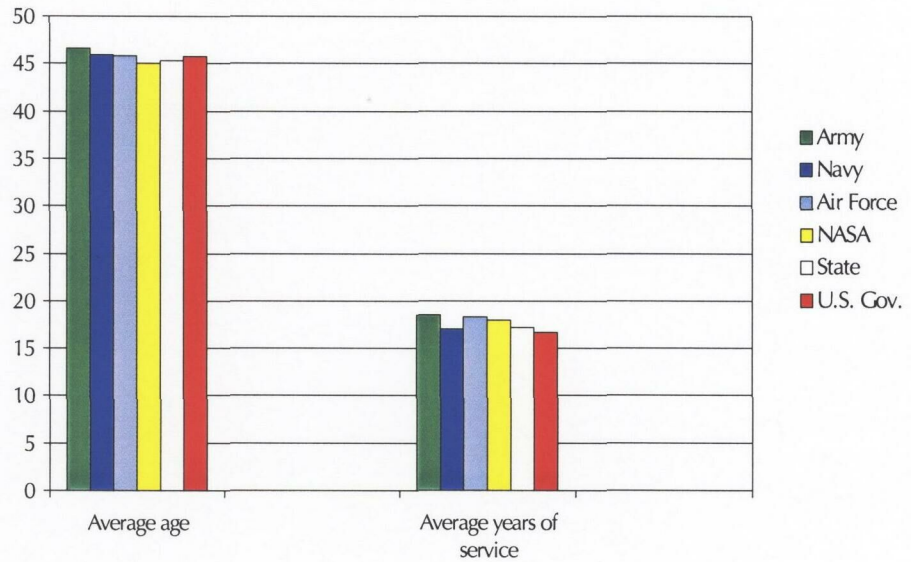
The cost per employee rises considerably with age for each grade, an indication that *for any given level of responsibility* an older employee means higher payroll costs (figure 34). For example, a 45-year-old GS-14 collects an annual salary that is 15.2 percent higher than a 31-year-old GS-14, and a 65-year-old GS-14 is paid 25.3 percent more than his 31-year-old counterpart.

Figure 34. Average salary by age and grade
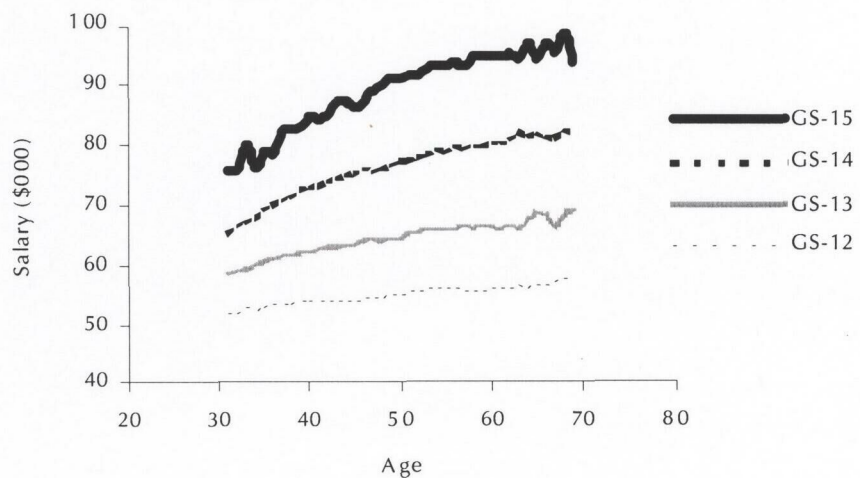
What of hours worked per employee? After 15 years of service (recall that 17 is the average number of years of service for a Navy civil servant), a government employee's annual leave increases from 20 to 26 days per year, representing a decrease of 2.7 percent of hours available for work per year. So salaries are higher for older employees, and they work fewer hours as well. Other reasonable indicators of the effect of aging on productivity might be absences due to sickness, and absences due to injury on the job. Figures 35 and 36[10] show that sick leave use among Navy civilians increases with age for both wage-grade and non-wage-grade employees, with wage-grade employees using considerably more than non-wage-grade employees at all ages. Another study, by the National Center for Health Statistics, found that workers aged 45 to 65 averaged 5.7 "work-loss days per year" compared to only 4.1 days for workers aged 17 to 24 [2].

Figure 35. Average days of sick leave used by non-wage-grade Navy employees, 1999
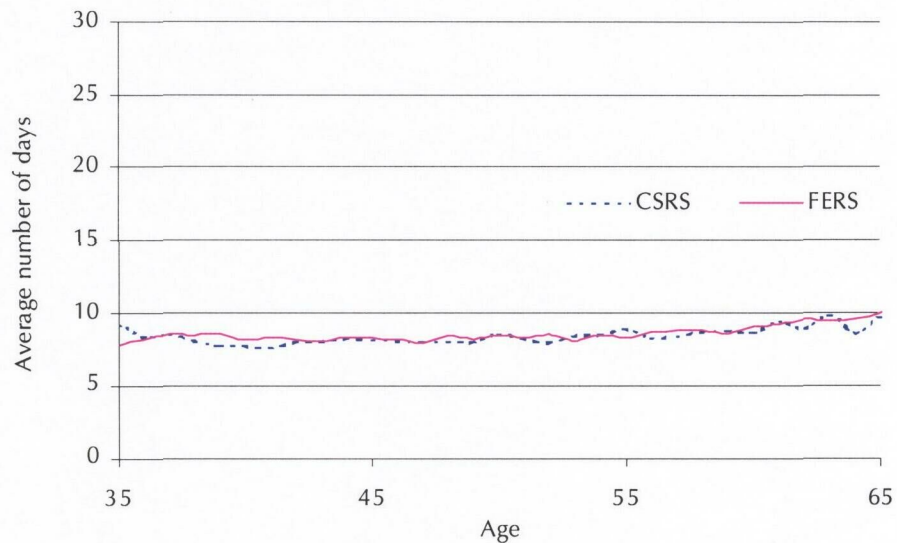
10. Both FERS and CSRS retirement plans are plotted because FERS members have no incentive to save unused sick leave for credit toward retirement annuities, as do CSRS members. Therefore, some argue that the type of retirement plan must have a major effect on sick leave use. However, there is no apparent difference in sick leave use between the two plans for ages that have a significant number of members in each plan.

Figure 36. Average days of sick leave used by wage-grade Navy
employees, 1999
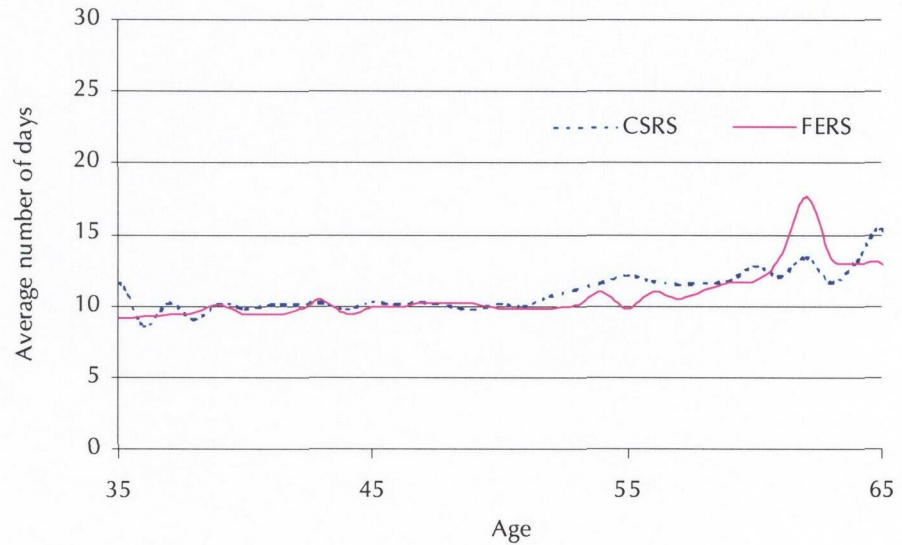
The story is different for accidents on the job. For each of the last 6 years for which complete data are available, the average age of injured wage-grade employees was lower than the average age of the workforce, and for 5 of the last 6 years, the pattern was the same for non-wage-grade employees (figure 37). This is consistent with studies conducted by the Bureau of Labor Statistics, which found that workers over 55 years of age account for less than 10 percent of all workplace injuries even though they make up almost 14 percent of the labor force.[11] This disproportionate number of injuries among younger employees could be the result of younger, less experienced employees using less caution when on the job. It could also be caused by the fact that supervisors are less likely than the rank and file to be exposed to hazardous conditions, and that supervisors tend to be older than the workforce average.

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11. Once an older worker is injured, however, that worker is apt to have a more serious injury and be out of work longer than a younger worker [2].

Figure 37. Average age of injured compared to workforce average age
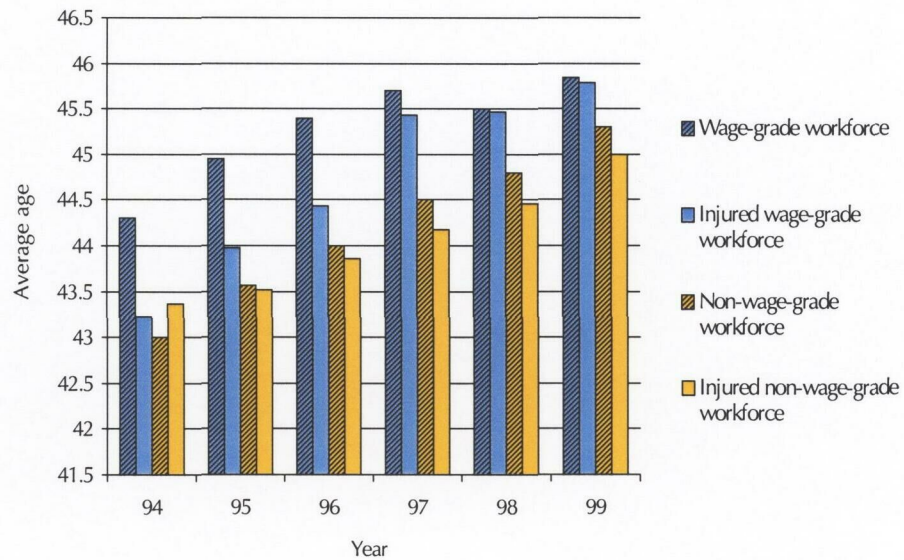
Although an aging workforce is clearly more costly per hour and works fewer hours per year, we cannot conclude that an aging workforce is less productive than a younger workforce unless we also take into account relative effectiveness. That is, do experience and wisdom offset the higher costs and shorter hours? And is the type of job important?

Where physical stamina or strength is required, as is the case for some of the Navy's wage-grade jobs, one cannot conclude that older workers are less capable because capabilities are affected more by fitness than by age. Although it may be more likely that younger workers are, on average, more fit than, say, workers 50 to 60 years of age, any employment or training policy linked to age alone would be discriminatory. Besides, the fitness gap has narrowed over the past decade and is expected to continue to narrow in the future. And on an individual basis, older workers often meet fitness requirements that some younger workers cannot, showing again that it is a mistake to draw competency conclusions based on age alone.

For non-blue-collar jobs, one study [3] that linked the earnings and productivity of 2,208 professional and managerial white male employees ("to preclude the confounding of our estimates...with the effects of race and sex") reached this conclusion:

> Our findings, taken as a whole, suggest that older workers' disadvantages in terms of schooling, skills obsolescence, and health are more than entirely offset by their considerable advantages in terms of greater seniority, post-hire training, and more valuable pre-hire skills and work experience.

But the author of the study also noted:

> Skills obsolescence exists for this group. Age differences in years since schooling give an advantage to older workers prior to age 50, presumably reflecting greater work experience and productivity. Thereafter, age differences in years since schooling are associated with an appreciable disadvantage to older workers, suggesting the presence of skills obsolescence. The results concerning engineers and scientists, who might be expected to be most susceptible to skills obsolescence, are more dramatic. Earnings differences between those aged 50 and 65 could differ by nearly 18 percent due to this form of skills obsolescence alone...presumably due to productivity effects.

> The policy implication, of course, is that greater employer, employee, and public investments in schooling and training are critical, especially in scientific and managerial fields... to mitigate age-related employment disadvantages even within high-tech industries.

In *Creativity: Flow and the Psychology of Discovery and Invention* [4], Mihaly Csikszentmihalyi writes:

> There is still quite a bit of controversy among scholars about the relationship between age and creativity. When the topic was first studied, the findings suggested that creativity peaked in the third decade of life, and less than 10 percent of all great contributions were made by persons over sixty. Opinions differ, however, about what qualifies as a great contribution. When we look instead at total output, the picture changes. In the humanities the number of contributions appears to hold steady between thirty and seventy years of age; the trend is similar in the sciences, and only in the arts is there a sharp decline after sixty. In our sample

productivity did not decline either; if anything it increased in the later years.

Psychologists have long made a distinction between two broad types of mental abilities. The first is what they call fluid intelligence, or the ability to respond rapidly, to have quick reaction times, to compute fast and accurately. This ability is measured by tests asking a person to remember strings of numbers or letters, recognize patterns embedded in more complex figures, or draw inferences from logical or visual relationships. This type of intelligence is supposedly innate and little affected by learning. Its various components peak early—on some tests it is teens who perform best, on some others it is twenty- or thirty-year olds. Each later decade shows some decrease in these skills, and after age seventy the decline is usually quite severe even among otherwise healthy individuals.

The second type of mental ability is known as crystallized intelligence. It is more dependent on learning than on innate skills. It involves making sensible judgements, recognizing similarities across different categories, using induction and logical reasoning. These abilities depend more on reflection than quick reaction, and they usually increase with time, at least until 60 years of age.

Although most capabilities necessary to perform effectively apparently do not deteriorate significantly until the late 60s, older workers are often seen as lacking in motivation. This is a consequence not so much of aging, but of being in the same job for many years without variation or challenge. That is, workers in their 40s are just as likely as workers in their 60s to be dissatisfied after 20 years of the same duties. The paragraphs that follow are from [5] and [6], respectively.

One cannot enjoy doing the same thing at the same level for long. We grow either bored or frustrated; and then the desire to enjoy ourselves again pushes us to stretch our skills, or to discover new opportunities for using them.

Research shows that intellectual performance required for learning is less affected by age than by perception, attention, motivation and a person's physical state. People who are capable of learning and who continue to use their intellectual abilities, maintain their learning capacity as they age.

In [7], economist Edward Lazear discusses the differences between senior and junior workers, and how they can complement one another:

> Young workers bring new skills and ideas with them into the firm. This is likely to be most important to industries undergoing rapid technological change.... More senior workers who received their formal training many years prior may have well-honed job skills, but are unlikely to know as much about the most recent research as their younger counterparts.

> Offsetting this is that senior workers may have a much better handle on the information that is relevant to this particular firm. Although the new entrant may have command at a general level of the latest methods, the senior worker is likely to know the details of those new and old processes that are most directly related to his or her sphere of production. Also, the older worker has an advantage in knowing those general skills and facts that are best learned on the job. Finally, since firms tend to be somewhat idiosyncratic, older workers have an advantage in understanding those attributes of the industry and of production that are specific to the firm. In short, older workers are almost certain to have an advantage over younger ones in firm-specific human capital and in the general human capital that is best learned on the job. Younger workers are more likely to have the edge in the general human capital that is best acquired through schooling.

> These arguments suggest that some mixture of young and old is likely to produce the most productive work environment. Younger workers can introduce new techniques to older workers. Older workers can impart the knowledge that they have obtained through years of experience about the idiosyncrasies of the industry and especially of the firm in which they work.

Therefore, we conclude that an aging workforce need not be a less effective workforce provided that (a) younger workers and workers from outside the Navy continue to be introduced into the workforce, especially in occupations of rapid technology change, and (b) potential skills obsolescence can be overcome through continuous learning programs, including variations in assignments, throughout employees' careers. As noted by author C. K. Prahalad in [8]:[12]

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12. Harvey C. Fruehauf Professor of Business Administration, University of Michigan.

The knowledge explosion, coupled with discontinuities and globalization, suggests that managers must continuously be exposed to new ideas, technologies, business practices, and cultures. The "half-life" of what we know is embarrassingly short.

Retirements and resignations

We have shown how the characteristics of the workforce have changed over the past decade, and how new employees have contributed to the changing face of the Navy's civilian workforce. But to help plan for the future and to tailor special retention programs, it is equally important to understand how resigning and retiring employees influence the shape of the workforce. Not surprisingly, the average age of resigning employees has risen since 1990, commensurate with the increased average age of the workforce over that period (figure 38).

Figure 38. Average age of resigning personnel
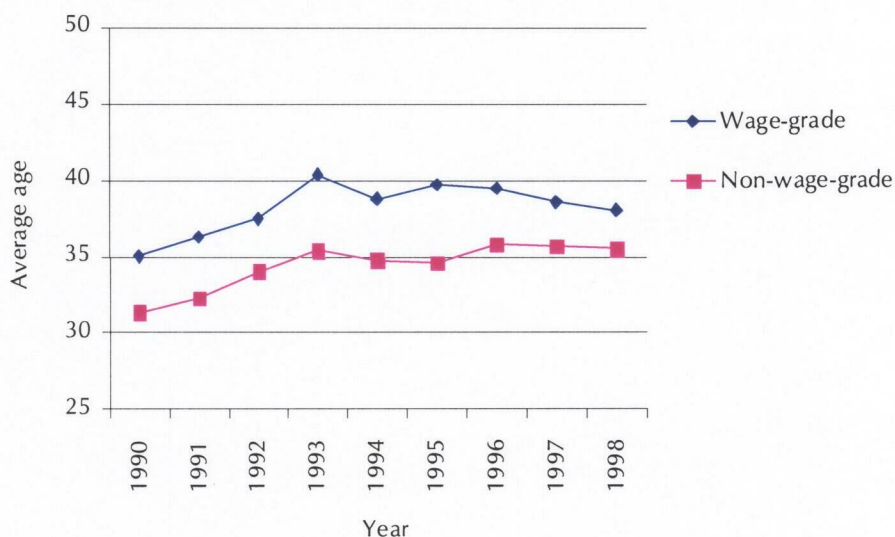
But the average years of service of resigning personnel is also higher than in previous years, rising roughly 3 years for both wage-grade and non-wage-grade employees (figure 39).

Figure 39. Average years of service of resigning personnel
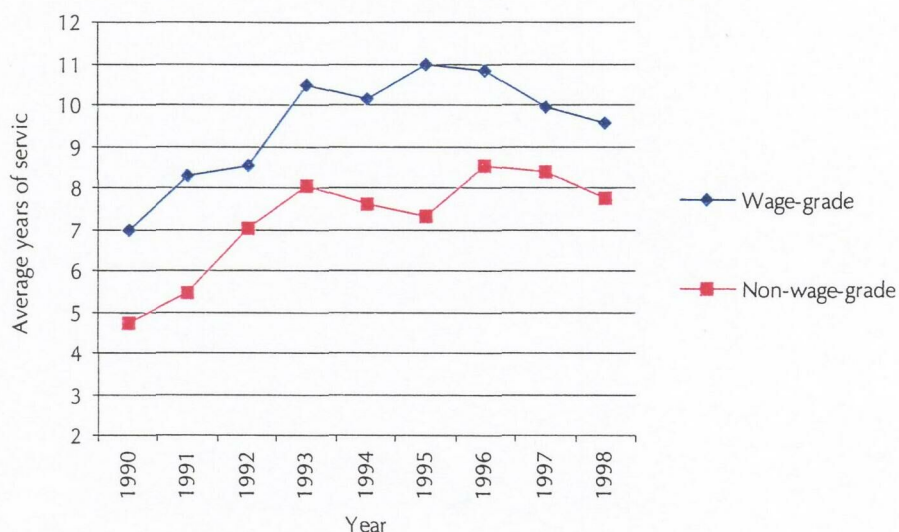
To those who think that a government job is a job for life, and there-fore there is little rejuvenation and revitalization within the government workforce, the trends evident from figure 39 may be welcome. But given the difficulty of promptly recruiting qualified replacements, the loss of trained and experienced employees (especially those with as many as 8 to 10 years of experience) is a serious loss of human capital, and a disturbing trend.

Regardless of whether one views the trends toward more mid-career resignations as a positive or negative development, the cause of this higher rate of mid-career resignations is certainly of interest. When the federal employees retirement system (FERS) was implemented in 1984, most observers predicted that there would be more mid-career resignations in the future because, unlike the previous retirement system (CSRS),[13] FERS benefits were "portable." However, a recent detailed analysis [9] concluded that "FERS has not increased separation rates among mid-career personnel, as some observers had thought." If this conclusion is correct, the reason for the increased separation rate during mid-career that the Navy has seen recently is

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13. Civil Service Retirement System.

more likely the increased availability of good jobs elsewhere. More-over, because our data do not differentiate between civilians leaving the Navy for the private sector and civilians leaving the Navy for another government job, we cannot conclude that FERS has any bearing on the mid-career separation rate.

Also of interest is the length of time that *new* employees tend to stay with the Navy before resigning. For all permanent employees hired between 1990 and 1998, figure 40 shows how many resigned within 1 year, 2 years, 3 years, and so on. Again, the trend is toward a higher percentage of resignations in mid-career rather than earlier— because the percentage of employees who resign after only 1, 2, or 3 years is declining and the percentage of those who resign within 4, 5, or 6 years is increasing. We have limited data for recent new employees, but the trends are not encouraging.

Figure 40. Length of time until resignation for new full-time permanent employees
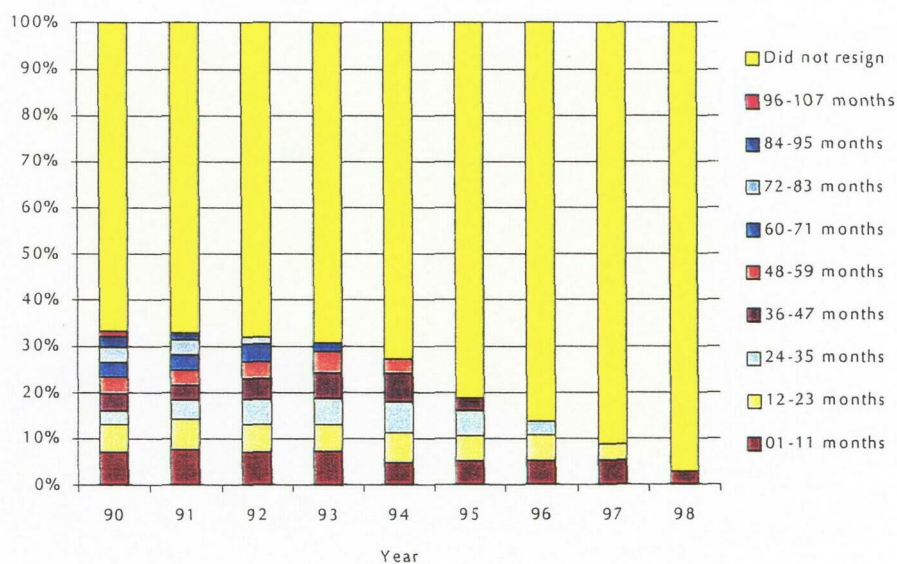
Another metric of interest is the percentage of employees who retire when they become eligible, because planners often project high rates of retirement when high rates of retirement eligibility are projected.

Navy data indicate that most employees do not retire in the year that they become eligible, or even after one year. However, at least over the past decade of downsizing when incentives were paid to encourage retirement, over 50 percent retired after 2 years, and nearly 60 percent retired within 3 years of eligibility. Figure 41 summarizes these results but also suggests that, now that retirement incentives have abated, the trend is reversing.

Figure 41. Length of time until retirement for retirement eligibles
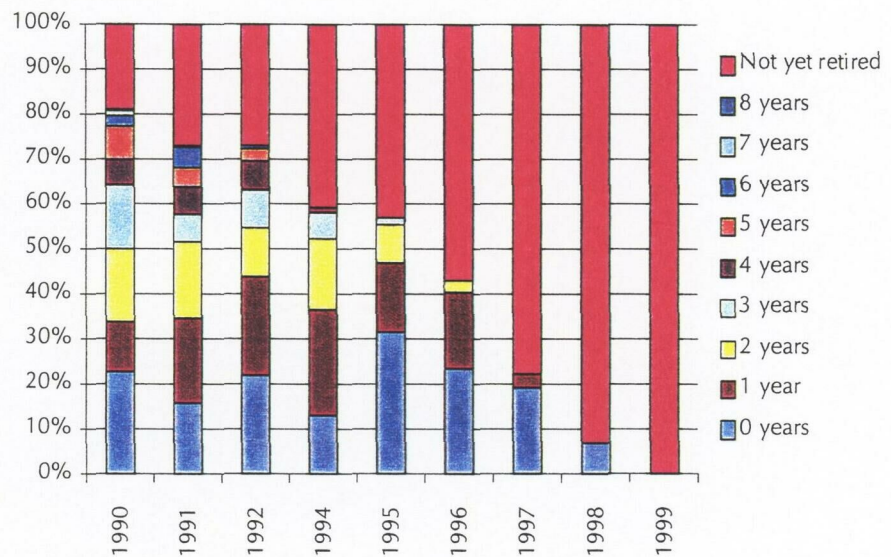
Figure 42 shows a second way of examining this issue. It plots all employees newly eligible for retirement in each year, and the number that actually retired in that year. Except for 1993 and 1994, substantially less than half of those newly eligible to retire actually retired in the year of retirement eligibility. These data and the data in figure 41 are probably explained by the likelihood that many employees who became eligible between 1990 and 1992 delayed retirement in anticipation of possible retirement incentives. When incentives were granted between 1993 and 1997, the retirement rate increased.

When a group of 20 Navy senior executives was surveyed in the fall of 1999 (appendix E) as to their retirement plans, their responses were consistent with the findings summarized above. In that survey,

respondents indicated that they planned to retire, on average, 2.2 years after they became eligible. Interestingly, the younger the respondents, the more likely they were to say they would retire immediately upon eligibility. Those who were approaching their eligibility date, or had recently passed it, were more likely to say they would delay retirement substantially past their eligibility date.

Figure 42. Retired eligible, retired, and early retired
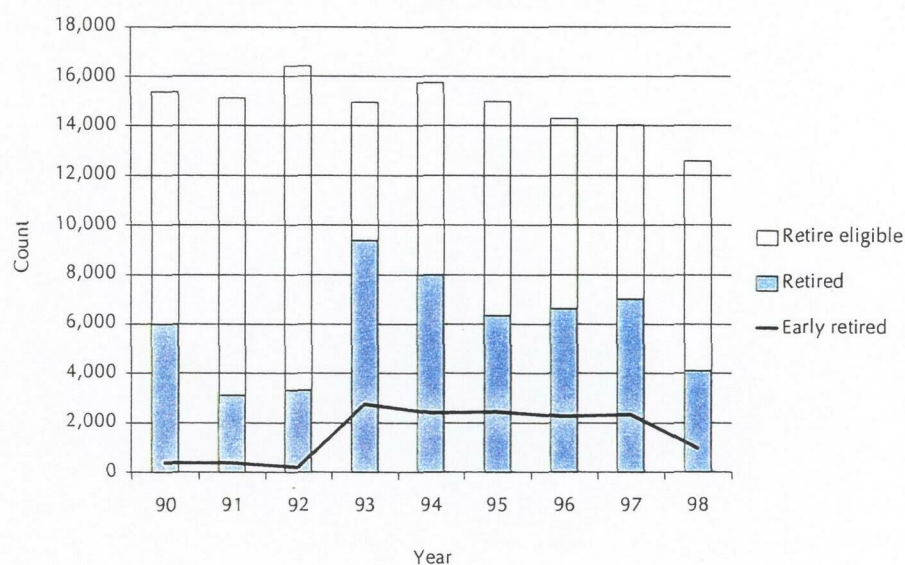
Performance evaluations

The average Navy civil servant performance evaluation is 4.17, on a scale of 1 to 5, where 1 is "unacceptable" and 5 is "outstanding."[14] We analyzed annual performance evaluations to determine whether the evaluations of any particular group are significantly different from those of other groups, when we control for age, gender, race, and function. We found that the probability of being rated as "unacceptable" is negligible, regardless of age, gender, race, or occupation.

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14. A score of 2 is "minimally successful," 3 is "fully successful," and 4 "exceeds fully successful." The evaluation scale has recently been changed to a simple pass-fail rating of "unacceptable" and "acceptable"; however, the new scale is not reflected in the data presented here.

Although age has a statistically significant effect (the older the employee, the higher the rating), this effect is too small to be of any practical significance. Gender and race also have only very slight effects. Women tend to have slightly higher performance evaluations than men. Blacks tend to have slightly higher performance evaluations than whites, whereas Hispanics tend to have slightly lower performance evaluations than whites. There are significant variations among the average evaluations of functional groups, however. Blue-collar workers, for example, average a full 0.7 points below administrative employees, 0.48 points below clerical, 0.46 below professional, and 0.38 below technical employees.

The Navy compared to other agencies

Figure 33 compared the average age and years of service of the Navy's workforce to similar characteristics of the U.S. Federal Government overall, as well as to those of the other Services, NASA, and the State Department. The comparison showed that, in general, the Navy workforce is typical.

Figure 43 shows how the Navy compares with the other Services in the overall use of sick leave. Note that wage-grade employees use considerably more sick leave than do non-wage-grade employees, and that the older CSRS employees (average age 49.6) use more than the younger FERS members (average age 42.3).[15] Navy use rates overall are comparable to those of the other Services.

Figure 44 compares the Services in regard to minority and female representation. As with age and length of service, the Navy is generally comparable with the other Services and NASA in both minority and female representation; however, the Navy employs a substantially lower percentage of minorities and women than does the State Department civil service workforce, or the U.S. Federal Government overall.

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15. Because FERS originated in 1984, and most CSRS members did not convert to FERS, few FERS employees were near retirement age in 1999. Similarly, since all new employees hired after January 1,1984, are in FERS, only a few CSRS employees are in their late 20s or early 30s. Differences in use may become apparent as more FERS members approach retirement age.

Figure 43. Sick leave use by Service and pay plan, 1999
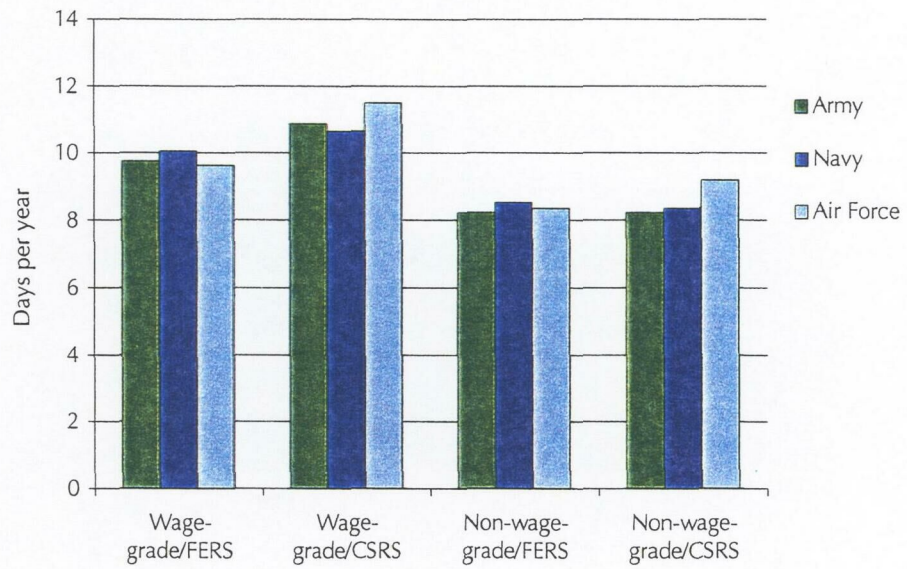
Figure 44. Minority and female percentages
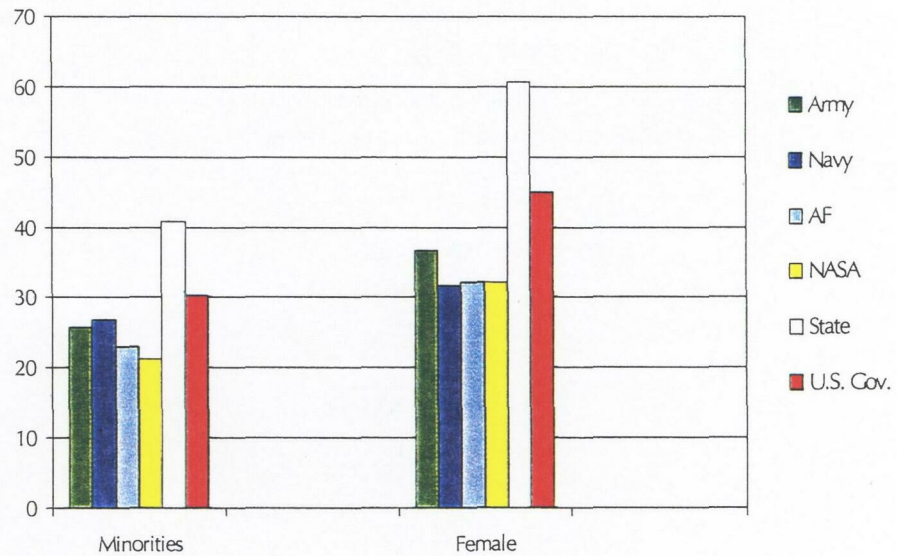
Figure 45 shows that, with the exception of NASA, the education level of the Navy's workforce is also comparable to that of the benchmarks.

Figure 45. Percentage of non-wage-grade employees with at least a Bachelor's degree
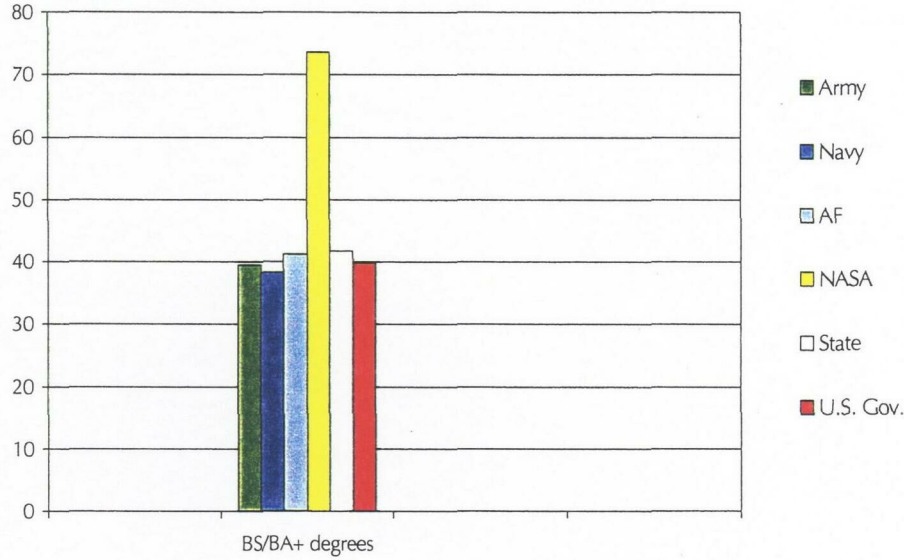
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Projecting the needs of the future

The shape of the future workforce

In April 2000, the Department of the Navy's strategic sourcing plan identified roughly 47,000 positions as candidates for "A-76" outsourcing studies,[16] and an additional 44,000 positions as candidates for "functionality assessments" (an examination of non-commercial functions for more efficient operation). Historically, A-76 competitions have resulted in about a 50-50 split between industry and DOD agencies [10], which means that about 50 percent of the A-76 positions could be outsourced over the next 5 years. Also, when the government has won an A-76 competition, savings have been roughly 20 percent. Therefore, of all positions designated for A-76 studies, about 60 percent, or over 28,000, may well be eliminated either through outsourcing or through more efficient government operations. There is no historical basis for determining the magnitude of savings that may result from the functionality assessments (FAs), but estimates have ranged from 10 percent to 25 percent. This could mean a reduction of an additional 4,400 to 11,000 of these positions over the next 5 years.

Figures 46 to 48 show the distribution of the 91,000 positions that have been identified for A-76 studies and FAs.

Because potential losses are disproportionately distributed among lower grades (figure 46), the average grade level of the workforce is likely to increase substantially after the strategic sourcing plans are implemented. Moreover, the positions to be eliminated will be predominately blue-collar and clerical (figure 47), and will have the largest relative impact on the administrative, supply, human resources management, and education specialties (figure 48).

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16. Outsourcing studies in accordance with the requirements of Office of Management and Budget (OMB) circular A-76.

Figure 46. Strategic sourcing potential impact, by grade level
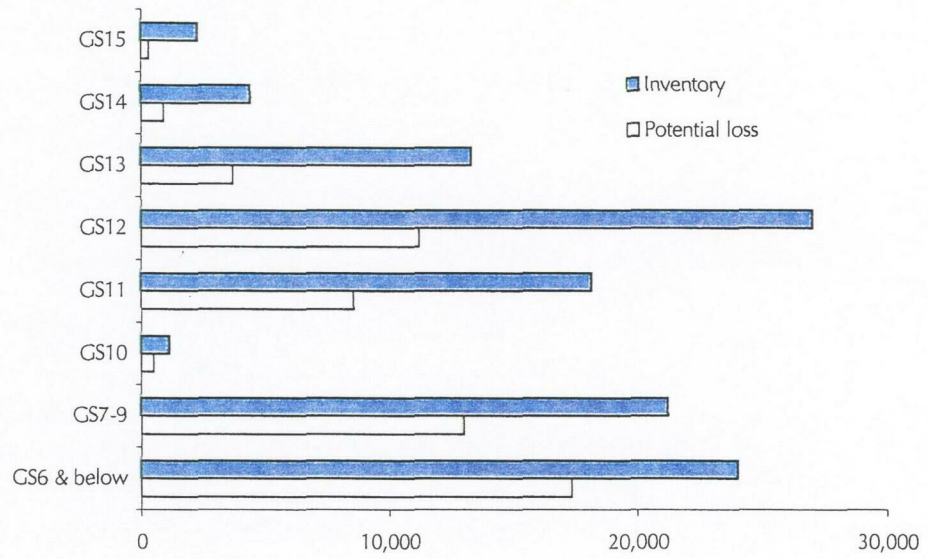
Figure 47. Strategic sourcing potential impact on functional groups
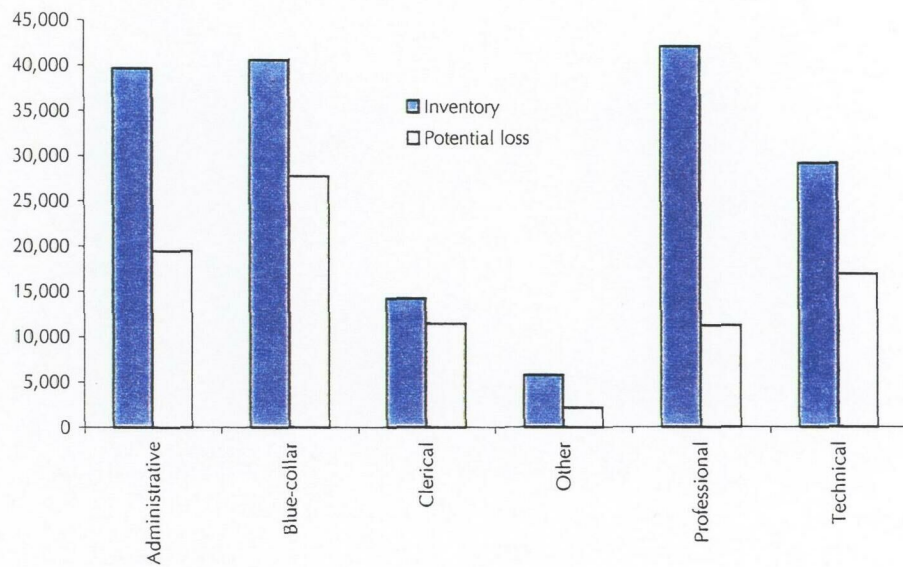
Figure 48. Strategic sourcing potential impact on top ten occupations
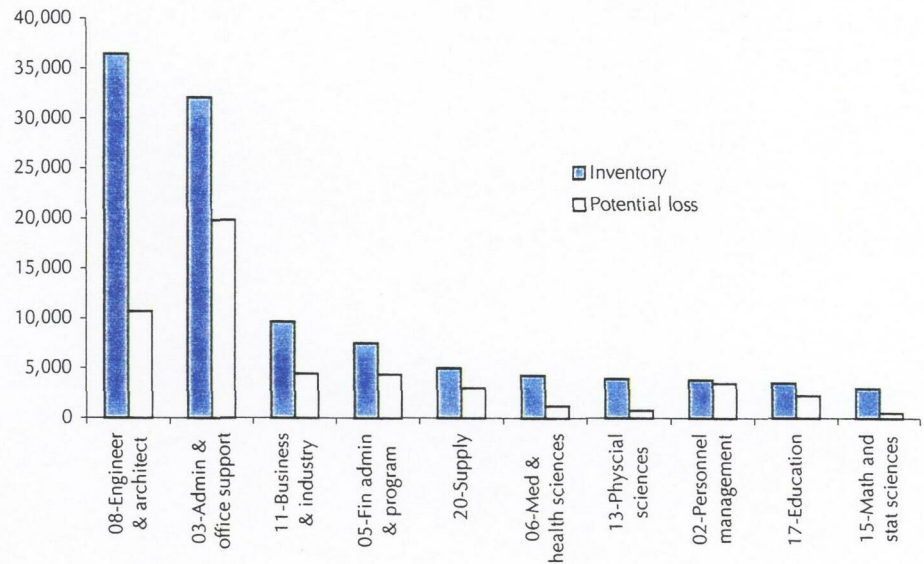
The workforce of the future is affected by more than strategic sourcing, however. Normal attrition and varying hiring rates will also have an effect. To project the future shape of the workforce based on all of these variables, we developed the Civilian Hiring and Attrition Management Program (CHAMP). As shown in figure 49, CHAMP uses the Navy inventory (block 1 in figure 49), labels positions identified for A-76 studies or FAs, and applies any desired estimated attrition rate for these positions (block 2). For personnel in the inventory that *are not* identified for A-76 or FA studies, plus those that *are not* separated due to outsourcing or FA reductions (block 3), CHAMP determines eligibility for retirement in any given year based on years of service and age, and then projects retirements in every PATCO category based on the history of retirement rates of those eligible in these categories over the past 10 years (block 4). CHAMP then sums (block 5) all remaining personnel who are not eligible for retirement and all those who are eligible but are not projected to retire, and applies historically based attrition rates due to resignations, deaths, adverse actions, etc. By summing all separations from blocks 2, 4, and 5, and applying past hiring rates (block 6) for these categories (or any hiring rate desired by the user), CHAMP is able to project future growth and attrition and overall workforce sizes broken down by function and

occupation. Conversely, for given workforce sizes planned by Navy budgets, CHAMP can project hiring requirements by function and occupation.

Figure 49. Civilian Hiring and Attrition Management Program (CHAMP)
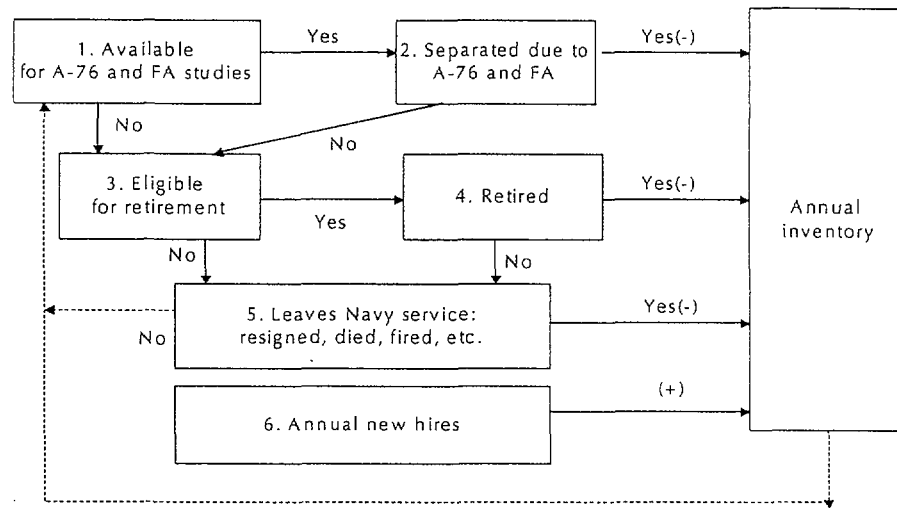
To verify the CHAMP model, we estimated workforce sizes for 1995 through 1999, based on retirement and other separation rates experienced from 1989 through 1994, and compared the estimates to the actual workforce of 1995 to 1999.[17] The results (figure 50) closely tracked the actual workforce size and composition for those years and verified the model.

We then projected the workforce for 2000 to 2010, based on a conservative manpower reduction of 15 percent due to A-76 and 10 percent due to FA (figure 51), and an aggressive A-76 reduction of 40 percent and FA reduction of 25 percent (figure 52). These projections assume that one-half of the savings occur in 2002, and one-half in 2003, and that both hiring and separations (other than for A-76) continue at the same rate as they did during the last decade.

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17. Block 6 used actual hires for 1995–1999, rather than projected hires, because we were verifying the model's ability to project personnel attrition beyond the Navy's control, which excludes hiring.

Figure 50. CHAMP model verification
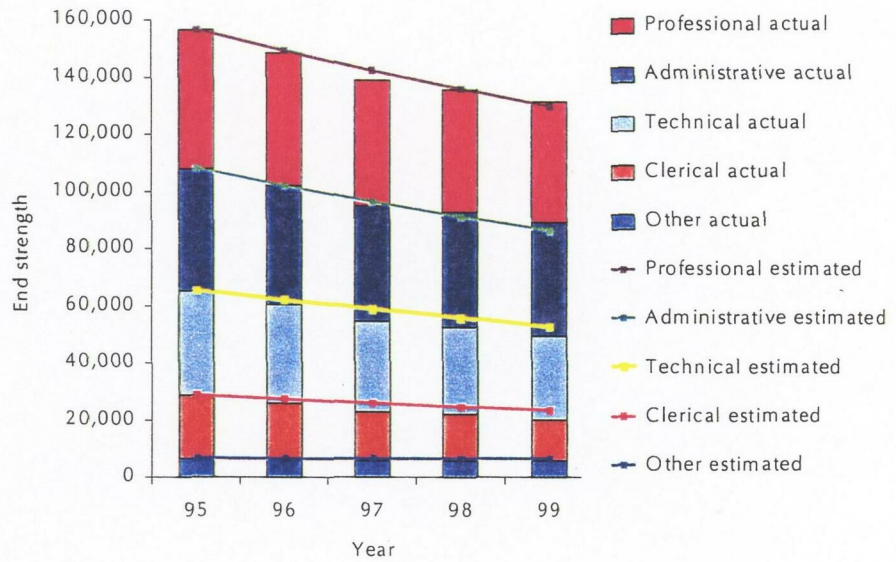
Figure 51. Workforce projections based on 15-percent A-76 savings and 10-percent FA savings
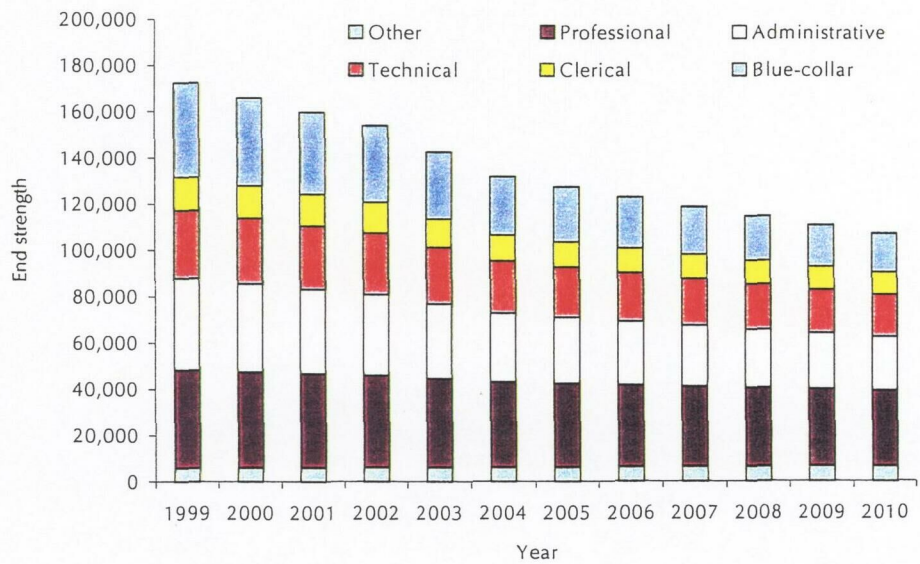
Figure 52. Workforce projections based on 40-percent A-76 savings
and 25-percent FA savings
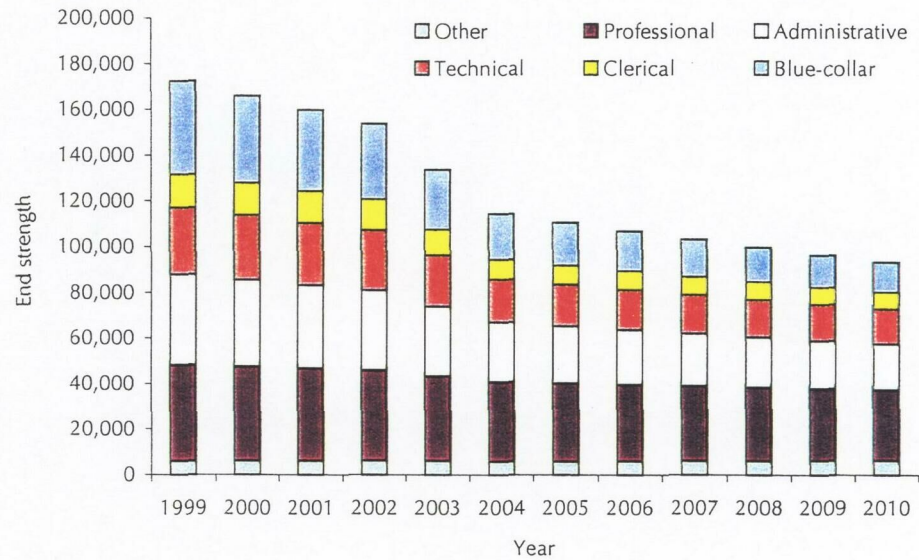
Even for the conservative savings projected in figure 51, the model projects an overall manning level in 2005 that is roughly 25,000 below the FY 2001 president's budget manning level of 155,000.

Characteristics of the future workforce

Our data have shown that the average grade of the workforce is likely to continue to increase, perhaps at a faster rate than previously, because of the change in the mix of occupations. And, unless functional assessments and strategic sourcing upset the current trends, the diversity of the workforce will increase as the diversity of the nation's labor supply increases.

The average age of the workforce is expected to increase steadily, at least until 2010. The workforce will be more expensive per hour and more experienced, on average, than today's workforce, but because of rapidly changing technologies and changes in the way work is done, employees will need more training—especially the more senior employees who will be more likely to require continuous learning programs to update their skills.

The resignation rate among mid-career employees has been increasing, and we expect this trend to continue. The future members of the workforce will be much less likely than those in previous generations to stay with single employers throughout their careers. This is the result of two factors:

- There are more dual-income families. It is always less risky for one spouse to change jobs when the other can provide income during the transition.

- Workers have seen or have experienced downsizing. They realize that their employers have no control over base closures and decisions to outsource. Even if they are higher performers, employees know that their jobs are no longer protected. In the past, job security was one of the greatest barriers to early resignations. Without that security, employees are more likely to leave for more pay or better working conditions. As long as other positions are plentiful and more attractive, this trend will continue.[18]

Although members of the workforce will be more likely to change jobs in mid-career, they will be less geographically mobile because there will be more dual-income families. Employees will be less likely not only to leave a job for another in another location, but also to stay in a job if it requires frequent or even occasional relocation.

18. The trends of the past decade, toward more mid-career job changes, occurred during a period of unprecedented economic growth and low unemployment. In a contracting economy, the trend will reverse.

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Meeting the needs of the future

The military model

The pyramid of subordinates

Comparison of military and civilian systems

A military human resources (HR) system exists to make warriors. To do this, it must do three things simultaneously: fill today's requirements with qualified people and ensure that there is a cadre of qualified replacements to fill all senior positions; generate a sequence of experiences that will produce future military leaders; and satisfy the needs of the individual.

The requirements of a civilian HR system are only slightly different. As in the military, the civilian HR system should have an effective means of creating leaders and filling today's requirements, and it too must meet the needs of the individual to ensure good morale and avoid high rates of attrition. But, unlike the military system, middle management and senior positions need not be filled from within by subordinate personnel; they can be filled by government personnel from other agencies, or by experienced personnel from industry, or even by military retirees. Therefore, there is no numerical need to ensure a "pyramid" of subordinate civilian positions within the Navy from which to draw future leaders. If all program analyst positions below GS-9 were eliminated, for example, the entry level could be at the GS-9 level; if all positions below GS-12 were eliminated, the entry level could be at the GS-12 level, and so on.

The lack of a need for a pyramid-shaped workforce in specific career fields provides some flexibility, but it introduces complexities as well. If all entry-level administrative positions, for example, were at the GS-12 level (starting salary of $51,204 in the Washington, DC, area), no high school graduates and few college graduates would be recruited

directly from school, and recruiting strategy would be directed toward enticing personnel from industry and other government agencies. The result would be more difficult recruiting and more mature, higher cost new hires. But the more mature workforce, having been transferred from other activities, would not necessarily be a workforce with directly applicable experience, as they would be if grown from within. So we would have a group of new hires more costly than if they were hired at an earlier stage of their careers, but with less applicable experience than if they had been developed from within. In effect, the worst of both worlds.

Therefore, even though it is not numerically mandatory to maintain a pyramid of subordinates from which to draw civilian middle managers and senior leaders, it is more efficient to retain entry-level positions for most occupations, as a ready supply of experienced civilians.

Promotion and rotation

The military and civilian systems are governed by different statutes that bear on how personnel are managed. In the military, rank is conferred on the individual, whereas by law in the civilian system, rank (that is, grade level) is linked to a position, not to an individual.

In the military, people are selected for promotion by a centralized selection board, and assigned to new positions; government civilians apply for and compete for new positions (at the same grade level or for a promotion), and are selected for a position by a selection board that is usually established by the supervisor of the position to be filled.[19] The military rotates personnel every 2 to 4 years, for training and career progression, and has an "up or out" policy—if not promoted, military personnel must leave the Navy. A civilian, if not promoted into a particular position for which he or she has applied, may apply for a transfer or promotion to other positions without limit, and

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19. There are exceptions. In "career ladder" positions, an employee who performs satisfactorily advances from entry level, grade by grade, until attaining the "working-level target grade," usually the highest non-supervisory level. This is common for most engineering positions, for example. Another exception is promotion through accretion of duties, where an employee receives a grade raise when it is determined that the original job has evolved into a different job with greater responsibilities.

may stay in his or her current position indefinitely until retirement, resignation, death, forced separation,[20] or abolishment of the job. There is virtually no forced rotation for Navy civilians, unless it is part of an agreed upon development program, and individual civilians are generally left to pursue their own training and development[21] (sometimes after hours with or without Navy financial support), and to seek out positions for which to apply for promotion. As a result, career development for civilians is ad hoc and haphazard, leading to a group of individuals with qualifications for advancement to senior positions that is smaller than it could be with more structured career planning.

The military practice of periodic rotation contributes to the experience base necessary for military personnel to advance through the ranks, and provides a reasonably fair way to ensure that personnel all have opportunities for growth and, therefore, promotion. But constant rotation is not without its costs. A recent survey [11] of 91 officers and enlisted personnel at ashore maintenance activities, with an average service time of 19.3 years for officers and 21.1 years for enlisted, indicated that the average time in their current positions was only 15.5 months for officers and 19.7 months for enlisted, whereas 18 civilians working with them, on the same or similar projects, averaged 74.4 months in their current positions.

The civilian component has long been credited with providing "continuity" and "corporate memory," and the figures just cited bear that out. Because there is no up or out policy in the civilian system, the Navy has no *obligation* to rotate civilians to provide for experience that would increase their chances of promotion. Training is provided solely to improve effectiveness in the current position (indeed, except for generalized leadership training, training that cannot be shown to be related to a civilian's current position is usually not

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20. Civilians can be separated if their performance is unsatisfactory, or if their job is eliminated, but job retention is not linked to age or to nonselection for another job.

21. Many employees have "Individual Development Plans" that they have prepared with their supervisors, but the employee has no assurance that funds will be available for training as scheduled, and frequently planned training is not received.

approved). With the high rate of turnover among the military, it would be unwise to apply a similar rotation policy across the board for civilians, because continuity would certainly suffer. Moreover, because recruiting and retention problems are already a concern for the civilian workforce, and because the number of dual-income families is increasing, it is likely that forced geographic rotation for many civilians would be as unpopular among the civilians as it would be counterproductive for the Navy.

But a static workforce, with little cross-fertilization of ideas across commands, is usually less effective than one in which workers do not stay within one organizational confine throughout a career, but move about and experience new ways to perform and conduct business. So the challenge is to achieve some rotation and new experiences for civilians, especially white-collar civilians, while not carrying the policy to such an extreme that the civilians move as much as their military counterparts and are no longer able to provide credible continuity.

We believe the answer is to adopt a voluntary rotation program for selected occupations, one that encourages movement across commands by placing a premium on cross-command experience when selecting personnel for advancement. Mid-career personnel would not be *required* to gain a wider variety of experience, but they would be advised that such experience would be seen as desirable—if not required—for promotion to senior positions.

Training

The practice of providing long term formal training to military personnel between assignments to make them better suited for new positions is an excellent policy because the best time for such training is when it has the least adverse impact on productivity—after one has left one position and before taking a new position. This practice is not usually applied to civilians because, by definition, if a civilian is selected for a position, he or she is considered qualified for that position and needs no additional training other than targeted on-the-job training (OJT). There is little doubt, however, that periodic long term training throughout a career can improve motivation and productivity; if it is a question of receiving such training between jobs versus no

training other than OJT for a considerable period of time (which is often the case), training before taking a new position is preferable. This practice should be implemented for civilians, but, to avoid the appearance of an unfair selection, it must be made known to all job applicants that the training is planned and would be provided to whomever is selected.

Optimizing existing assets through continuous learning

As we have shown, it is possible to describe the shape of the workforce of the future with some accuracy, given certain attrition and recruiting assumptions. The challenge is to get the most out of that workforce as possible, while maintaining morale and controlling attrition. One way to optimize productivity is to reorganize. It is well known that the Navy is both capable and willing to make organizational changes to improve efficiency; in fact, reorganization has been and promises to be the single most prevalent method for achieving savings in most large organizations, and the Navy is no exception. In addition to reorganization, what else can be done to improve the productivity of the civilian workforce?

- We can improve processes and procedures.

- We can improve the facilities and tools (including information and data) that are provided to the workforce.

- We can improve the capability of the workforce itself, either by applying higher recruiting standards, or by increasing training and education, or both.

The Navy and OSD management hierarchies have a well-organized and prolific advocacy for the promulgation of processes and procedures, and for reviewing and streamlining them.[22] And there is a mechanism to review and update facilities and tools, which is exercised annually through the budget cycle. Of course, the existence of these mechanisms within the budget process does not ensure that facilities and tools are of the latest technology or are maintained at

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22. Acquisition reform, for example, has generated considerable savings through the streamlining of procedures and regulations.

the highest possible readiness, but the advocacies are in place, and the budget cycle ensures that these areas are addressed annually.

Contrast this with the situation governing the third method of improving productivity—improving the workforce through enhanced recruiting or training. There are no advocacy groups or interested parties for establishing recruiting standards for the various occupations in the Navy, nor is training a budget item that is tracked or reviewed by any single organization or training advocate. The civilian personnel data system has no records indicating the amount of training per individual, and the PPBS does not budget for it or review it.[23] There is no way to observe trends in Navy-wide civilian training (except manually through costly and time-consuming data calls to every claimancy and subordinate command), or to link performance changes with training and education. There is no way to compare training and education expenditures for Navy civilians with those of other agencies, or to predict future training needs.

There are mandatory training requirements for security and equal employment opportunity (EEO), and, for those stationed overseas, counterterrorism training is required. There is a requirement for first-time supervisors to receive supervisory training but no requirements for orientation training of new employees and no minimum training or education goals for the workforce.

The weak link in the management of the Navy's civilian workforce is the lack of cohesive training and development programs for most occupations. New employees must be trained promptly and effectively to ensure that they become productive as soon as possible after hiring. Mid-career employees need training and education to remain current with technological advances and new work processes, such as those emphasizing teams and teaming, and leadership and management training should be made available to prepare many for

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23. There are three notable exceptions: The DAWIA program mandated by Congress for the development of the defense acquisition workforce [12], the program for the development of personnel in the financial career path [13], and the practice of the Office of the General Counsel to centrally establish standards for recruiting, career development, and career progression [14].

advanced positions. Finally, established workers need continual training and education to hone their skills, keep up with technology, and improve motivation by rekindling their interests with new techniques and ideas.

In keeping with the Navy's decentralized management philosophy, the job of budgeting, planning, and executing civilian training and education has been left to the individual commands. This has the advantage of ensuring that training is sponsored and funded by those most likely to benefit and those most likely to be aware of what is needed and when. Unlike the military side of the Navy, however, there are no minimum training requirements that apply across the Navy for specific civilian occupations (although SECNAVINST 12410.22A [15] "recommends" that 1 percent of the annual activity operating budget be allocated to support non-salary training costs), and no governing guidance to ensure that training is consistent for the same civilian career specialties throughout the Navy.[24]

A common belief is that education and training benefit the employer because they can increase productivity and effectiveness by improving the skills and knowledge of the workforce. Although this is true, the effect on productivity and effectiveness goes beyond what can be gained merely through improved skills and knowledge. Education and training, or more specifically the *promise* of education and training, is an effective recruiting tool; in fact, when the promise of job security is no longer an effective, or even believable, incentive in attracting new employees, the promise of self-improvement often is. As one author notes [16]:

> New policies must reflect new forms of security while embracing the emerging realities of flexibility, mobility, and change. If security no longer comes from being *employed*, it must come from being *employable*. Employability security—the knowledge that today's work will enhance a person's value in terms of future opportunities—is a promise that can be made and kept....Challenging jobs on significant projects are more important than promises about the future or benefits programs contingent on long service....Continuing to

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24. Again, acquisition and finance specialists are an exception.

upgrade skills and pursuing new opportunities is a lifelong proposition, an essential part of the corporate fitness regime for global competition.

Second, education and training provide stimulation and renewal, especially for longer term employees in need of change and revitalization. The learning experience not only enhances skills and knowledge, but can also be an excellent motivator.

How much training is enough?

The American Society for Training and Development (ASTD) provides one of the most comprehensive overviews of employer-offered training in the United States. In its most recent report [17], based on 1998 training data from 501 U.S. organizations, training expenditures varied from 1.1 percent of payroll for health care organizations to 2.6 percent for the finance/insurance/real estate industries. For large organizations (those with more than 2,000 employees), training expenditures represented 1.5 percent of payroll. For government organizations,[25] training expenditures averaged 1.6 percent of payroll. For all organizations surveyed, training expenditures averaged 2 percent of payroll overall.

Management, however, is often more interested in how it compares with superior organizations than with merely "average" organizations. Recognizing this, ASTD identified "training investment leaders" by rating the surveyed organizations in the following four areas:

- Investment—1998 training expenditures as a percentage of payroll and 1998 training expenditures per employee (equally weighted)

- Time—total training hours per employee eligible for training

- Reach—percentage of employees eligible for training who received training in 1998

- Sophistication—percentage of training time in 1998 delivered using learning technologies.

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25. Organizations included federal, state, and local government organizations.

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The 10 percent of organizations with the highest combined scores across the four categories were identified as training investment leaders. On average, these leaders spent 3.6 percent of their 1998 payroll on training.

Although the amount of funding for training is not a direct indicator of the quality of training or the productivity improvements that might result, it is a useful metric for comparison and planning purposes because there is evidence of correlation. For example, organizations that increased their training budgets, particularly after announcing layoffs, were twice as likely to report improved profits and productivity as the firms that did not increase their investment in training. Among those that increased training, "an impressive 79 percent boosted profits long term, and 70 percent raised productivity" [18].

Although the Navy might consider 1.5 percent (the average expenditure of large organizations), or 2 percent (the average of all organizations surveyed) as appropriate minimums, these are not the expenditures of a world-class organization. An organization trying to compete and excel in today's marketplace must train and educate to maintain technological skills, to reduce attrition, to revitalize an aging workforce, to make up for recruiting shortfalls, and to maintain efficient processes and procedures during downsizing. Interestingly, the Navy has a target that is in line with the expenditures of the training investment leaders. The aforementioned SECNAVINST 12410.22A [15] "recommends" that 1 percent of the annual activity operating budget (which includes not only civilian payroll, but such other major elements as travel, cost of fuel and maintenance, base operating costs, and contractor support) be allocated to support non-salary training costs.[26] This equates to 4.1 percent of the civilian payroll in 2000!

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26. One percent of the $50.7-billion operating budget in FY 2000 is $507 million. That is 4.1 percent of the $12.3-billion civilian payroll portion of the operating budget.

Expenditures for Navy civilian training

Are Navy activities coming close to this recommendation? There is no Navy database or financing document that summarizes Navy expenditures on training for civilians. Some data are kept by individual commands, but where reorganizations, downsizing, or relocations have occurred, much of that data have been lost for prior years, and meaningful trend analysis for the Navy civilians is impossible. Nor are there any procedures to determine compliance with the Navy policy of 1 percent of the operating budget to be spent on training.

We were able to obtain data from some major commands with individual data calls and manual extraction. Some of the data we received had gaps for some years and had disclaimers suggesting that they were incomplete or had been estimates only, or that they excluded some in-house training. Nevertheless, in the aggregate (figure 53), we think the data provide a useful insight into the general level of training expenditures for civilians in major Navy Command headquarters.[27] In particular, they indicate that the reporting Navy organizations, at less than 1.4 percent in training expenditures as a percentage of payroll, (a) are below average when judged against other government organizations, (b) are further below average when compared to organizations with more than 2,000 personnel, and (c) are substantially below Navy policy recommendations and the training investment leaders of the ASTD survey.[28]

From the standpoint of training expenditures for civilians, the Navy's shipyards are the standout organizations. They also come closest to meeting the goals outlined in the SECNAV Instruction. Although the trend in average expenditures (figure 54) has been down for most of the past decade, the training averages, now at about 4 percent, are still higher than in most other Navy organizations and are comparable to the world-class standards of the ASTD leaders.

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27. All commands were not solicited for data; therefore, if a command is missing, it does not necessarily mean it had no data.

28. Both the ASTD survey and the Navy expenditure data include costs to deliver training, such as tuition, training materials, and payments to outside trainers, and exclude wages and salaries of the trainees. Our baseline agencies, like the Navy, do not collect civilian training data in summary form, so we are unable to compare the Navy with these agencies.

Although as much as 3 weeks of training for each employee may be impractical for many commands, certainly 1 week should be an absolute minimum. We think there is persuasive evidence that a career with continuous learning provides renewal as well as important new skills, especially for long-term employees. Whether it is through formal or informal training, or rotational assignments, or all three, it is most likely to lead to higher productivity and greater job satisfaction, and, by extension, increased retention.

Occupational leaders

Centralization versus decentralization

Unlike the other Services, the Navy has a long tradition of decentralization, basing most management decisions on the premise that authority should reside with the individual or individuals who have responsibility for a function or product, and that responsibility and commensurate authority should be delegated to the lowest practicable level. Although the other Services have gone to more centralized planning and execution for their civil service workforce, the Navy has maintained its policy of permitting commands with the most immediate and firsthand knowledge to tailor their operations and problem solutions to local requirements.

This management philosophy has served the Navy well over the years, as separate commands have been individually responsible for, among other tasks, their own civilian recruiting, and for civilian training and career development programs.

But consistent standards and centralized data suitable for Navy oversight are lacking. As noted earlier, there are no advocacy groups or interested parties to establish recruiting standards for the various occupations in the Navy, and training is not a budget item that is tracked or reviewed by any single organization, occupational group, or training advocate. There is no way to observe trends in Navy-wide civilian training or to link performance changes with training and education. And there is no mechanism to compare training and education expenditures for Navy civilians with those of other agencies, or to predict future training needs.

We would not advocate any policy that would attempt to correct these deficiencies by centralizing authority, for, as noted in *Reinventing Government* [20]:

> In today's world, things simply work better if those working in public organizations...have the authority to make their own decisions. Decentralized institutions have a number of advantages:
>
> - They are far more flexible than centralized institutions; they can respond quickly to changing circumstances and customers' needs.
>
> - They are more effective than centralized institutions.
>
> - They are far more innovative than centralized institutions.
>
> - They generate higher morale, more commitment, and greater productivity.

But, as with the DAWIA program, it is possible to have decentralized responsibility, authority, and execution, but centralized management information and standards. In fact, it would be useful for each decentralized command to have access to data showing how they compare with other Navy commands, and for senior Navy managers to have data that show trends and totals for comparison purposes. The decentralized nature of Navy execution could be enhanced if major occupations had "occupational leaders"[29] who maintained standards for each occupation, to be used by the executing commands. The leaders would:

- Identify trends in skill shortfalls and surpluses

- Establish minimum qualifications for new hires

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29. The occupational leader for human resource occupations would be DASN(CPP/EEO); for IT, the occupational leader would be the Navy's Chief Information Officer (DONCIO); and so on. Each leader would be assisted by a small team of personnel, some part-time, with a history of distinguished service in the occupation.

- Specify core competencies required at different steps of career paths

- Set minimum experience, education and training requirements necessary for career advancement

- Oversee the database and the status of the occupational community.

Occupational leaders would ensure that appropriate attention is paid to key occupations, such as information technology, human resources, and financial management to respond to claimants' unique needs, and to changes in technology and the labor pool. They would establish standards to improve the quality and flexibility of the workforce, by providing consistent recruitment and promotion criteria, and focused education and training. By doing so, they would provide the career framework that helps employees Navy-wide to set goals and progress in their careers and, thus, potentially improve retention.

Succession planning and leadership development

We have noted the importance of continuous learning that includes orientation, career development, and training to maintain management and technology currency. An equally important element of a complete training and education program is succession planning and leadership development, which is the practice of developing a pool of trained and experienced high-performing employees from which replacements are selected to fill vacant senior positions. This is particularly true for an organization like the Navy which gains most of its senior leadership not from outside, but from its subordinate ranks.

According to a recent survey of private-sector and government organizations, 61 percent of corporations surveyed have formal succession programs, and another 32 percent have an "informal" approach that they are changing to formal. However, only 28 percent of those government organizations responding had, or planned to have, a succession management program [21].

The Navy is among those agencies that has a civilian leadership development program [22], and an asociated civilian leadership board (CLB) that plays a significant role in selecting Navy participants for

the Defense Leadership And Management Program (DLAMP).[30] Occupational leaders could complement this process through participation with the CLB, establishing selection criteria for the participants, and identifying experience, training, and leadership courses required for advancement.

Recruiting and retention

Legislative change

A fundamental problem facing Navy managers is the inability to recruit rapidly to respond to changing workloads and the expectations of new applicants. In the private sector, recruiting and selection are often completed in a matter of days for internal promotions and reassignments, and in just a few weeks for external recruiting. Representatives of private sector firms that we interviewed stressed the need for prompt action. In fact, one placement firm specializing in Information Technology recruitment in the Washington, DC, metropolitan area said that if its clients do not interview and make selection decisions within a few days of receiving a listing of proposed new hires, the firm drops them as a client. "We simply can't expect the applicants to wait as much as a week for our client to make a selection decision. The desirable applicant, by that time, will have accepted a job offer somewhere else."

Contrast this private sector recruiting speed with the speed of Department of the Navy recruiting, which was recently studied by a team "of over 60 Navy and Marine Corps personnel representing the major HRSCs, HROs,[31] and customers around the country [23]. That study found that the *average* time for over 3,600 internal recruitments in the July 1 to October 31, 1999, period was about 105 days, and 1,000

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30. DLAMP is a DOD-wide program for growing future civilian leaders through "joint" civilian training, education, and development. There are currently about 1,000 DOD participants, with about 300 from the Department of the Navy.

31. Human Resource Service Centers and Human Resource Organizations.

external recruitment actions averaged nearly 160 days,[32] with nearly a third averaging more than 200 days! Clearly, the Navy is operating in a different league than the private sector and cannot hope to compete without fundamental changes to the laws, regulations, and procedures that govern the hiring process.

For the long term, looking ahead to 2005 and beyond, this situation must be corrected or the Navy will be incapable of carrying out its missions effectively. The corrections must place more hiring authority and flexibility into the hands of the managers responsible for agency performance, recognizing that, to truly accomplish this, some elements of current government policy, popular in some quarters, must be abandoned. For example, managers should have the authority to waive the requirement to advertise vacancies if they are aware of qualified candidates, and to select based on merit alone, without providing preference to veterans or military spouses. These changes may not be possible for all new positions, but perhaps such flexibility could be permitted for as many as one-half of all vacant positions, or for all "critical" positions, to enable prompt recruiting.

Because significant legislative changes are necessary in any event to provide the reforms needed, another alternative would be to recognize that many Navy civilian jobs are more akin to military positions than civil service positions, and that a special and unique pay system should therefore be set up for Navy civilians (or perhaps for all DOD civilians). A separate pay system, one that addresses the special needs of Service civilians, is not unprecedented. The State Department, which has foreign service employees as well as civil service employees, has a separate pay system for those in the foreign service. Indeed, the Navy already has one large group of civilians operating under a unique pay system—the 3,200 civilian mariners in the Military Sealift Command, which use a variation of the Federal prevailing rate system.

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32. Time elapsed between the time the request leaves the manager to the hiring date, including almost 50 days for managers to make a selection decision after receiving candidates from HRSCs/HROs.

Retraining

Absent sweeping changes that solve the fundamental faults of government recruiting, short-term Navy solutions can help. Certainly, the active involvement of occupational leaders can be of great assistance in adjusting minimum standards for new recruits, to broaden the pool of potential hires. For example, according to the Mindbank Consulting Group, 7,119 university degrees were awarded in 1996 in the fields of psychology, social science, and letters, and only 560 computer science degrees were awarded. Mindbank contends that "73 percent of the IT workforce is functioning with other than a computer science degree,"[33] and that those needing IT help must look beyond the usual sources to find trainable non-IT personnel to get the job done. They contend that aptitude (not just applicable formal schooling) is a good indicator of who can succeed in an IT career, and that people with music and language degrees do well in the IT field, as do those with puzzle-solving skills and those who pay careful attention to detail. This has prompted the Northern Virginia Regional Partnership to contract with Mindbank to develop training courses to convert non-IT employees in Northern Virginia companies into productive members of those companies' IT workforce.

Retraining in-house personnel to fill vacant positions in other career fields is an idea that has worked well in the past. In 1963, the Naval Sea Systems Command developed a 1-year program to retrain mechanical, marine, and electrical engineers selected from within the command, for vacant electronic engineering positions that had been hard to fill because of shortages caused by the high-priority space program. Forty-three engineers were successfully retrained and most stayed in the command, continuing their civil service careers as electronic engineers.

Advocates of retraining in-house personnel for hard-to-fill positions say it is superior to retraining new recruits because there are fewer unknowns and there is a higher probability that retrained employees will stay after receiving the training. In today's environment, where

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33. Neal S. Gundstra, Ph.D., founder and president of Mindbank Consulting Group, Inc., Vienna, Virginia.

Navy commands are downsizing at the same time they are trying to fill shortage-category positions, retraining is particularly appealing because it provides job opportunities for employees who might otherwise have to be separated.

Co-op programs

Since 1993, the Navy has converted 41 percent of 6,243 co-op students[34] to full-time permanent employees after they earned their degrees. Despite this success, the size of the co-op program has been gradually reduced from 1,361 students in 1993, and 1,032 students in 1994, to only 683 in 1999. A co-op program has many advantages: It provides financial assistance to students during college, it provides students with an opportunity to learn firsthand what the Navy does and thus determine if it is suitable for a career, and it gives Navy managers an opportunity to observe potential new employees in the workplace, before committing to hire them permanently. Given the difficulty of competing with the private sector for new employees, the Navy should actively promote and expand the co-op program to increase opportunities to hire new college graduates.

Advertising

The data we have presented indicate that many new Navy employees are hired from other government agencies. If the Navy is comfortable with this source of new employees, it might consider placing recruitment ads in *The Federal Times* or the *Government Executive*, and other periodicals read by the federal workforce, to expand the already sizable pool of non-Navy civilians interested in working with the Navy. Conversely, the Navy might be better served by emphasizing alternative strategies to attract more entry-level employees from colleges.

In either case, the Navy should consider hiring a firm skilled in marketing and advertising to identify periodicals and electronic media popular with various occupational groups, to better focus advertising to age groups and skill levels desired, and to ensure that people know that you don't have to join the Navy to work for the Navy. This could

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34. Students working for the Navy while completing their college degree.

be a national campaign, funded centrally on behalf of the occupational leaders, with phone numbers, websites, and e-mail addresses linked to specific commands with specific recruiting needs.

Also, the Navy web page should provide a link to a site for Navy civilian job announcements (currently, it provides a link to all federal civilian job vacancies).

Conclusions and recommendations

The Navy's civilian workforce is similar to that of the government civil service and the other Services in terms of education, age, and years of government service.

In regard to diversity, the Navy's civil service workforce is similar to that of the other Services and has continued to improve, but it lags the civil service workforce overall. In the future, however, minority representation may decline or increase only slightly because positions undergoing strategic sourcing (clerical and blue-collar) tend to be positions with higher-than-average minority representation.

The Navy's strategic sourcing will have the least affect on professional personnel, and the most pronounced affect on blue-collar, and clerical positions. This is a reasonable outcome of strategic sourcing, given the likely needs of the future and the greater investment in human capital represented by the professional workforce.

The average grade level of the Navy civilian workforce is increasing, but primarily as a result of changes in the mix of work and occupations and how work is performed, not as a result of more rapid grade raises for individuals. As strategic sourcing continues, the average grade level will continue to increase, because the jobs most likely to be eliminated will be lower grade jobs.

The average age of the Navy's workforce has increased 5 years over the past decade. Although an aging workforce will be a more costly workforce, it will not necessarily be a less productive one if a policy of continuous learning is pursued. We recommend such a policy, especially for high tech occupations.

New Navy civilian employees are older than is generally believed, averaging 34.4 years overall. New employees without prior service average 31 years of age, and those with prior government service average as much as 39 years. Nearly 50 percent of new employees have

prior service with the government, either in the military or in other government agencies, and this prior service averages nearly 10 years. Therefore, we recommend that advertising, recruiting, and training recognize this demographic with targeted programs.

The Navy does not have a data system that provides adequate information for management oversight. The data system currently in use does not provide information on the skills, training, or past work experience of individual workers, nor does it indicate the source of new employees (unemployed with no prior work experience, private sector, other government agency, military, college, etc.), which would be helpful for planning recruiting and training programs. We recommend that the Navy develop and maintain such a database.

Although training expenditures as a percentage of payroll appears to be adequate at the Navy's shipyards, training expenditures for most of the other commands for which we obtained data were less than 1.4 percent of payroll. This is below the averages for other large government organizations, and substantially lower than SECNAV guidance of 4.1 percent, a level we think is appropriate for an effective training, retraining, and education program.

The average time to recruit new employees from outside the Navy is nearly 160 days, compared with 7 to 14 days in the private sector. Unless fundamental changes are made to current recruiting laws and regulations, we think the Navy will continue to lag the private sector, regardless of what internal procedural improvements might be implemented. And until recruiting times can be competitive with the private sector, the Navy should expand co-op programs to improve recruiting, emphasize expanded orientation training to get the most out of new workers as soon as possible after hiring, and provide technical training and refresher training for workers in mid and late career. In addition, we believe that retraining and career conversion programs for exceptional mid-career personnel in declining disciplines is the best approach to meet emerging requirements.

The positions identified for strategic sourcing A-76 and functionality assessments include a large number of positions in the human resources (HR) community. Although we do not question strategic sourcing analysis of these positions, it would be disruptive to conduct
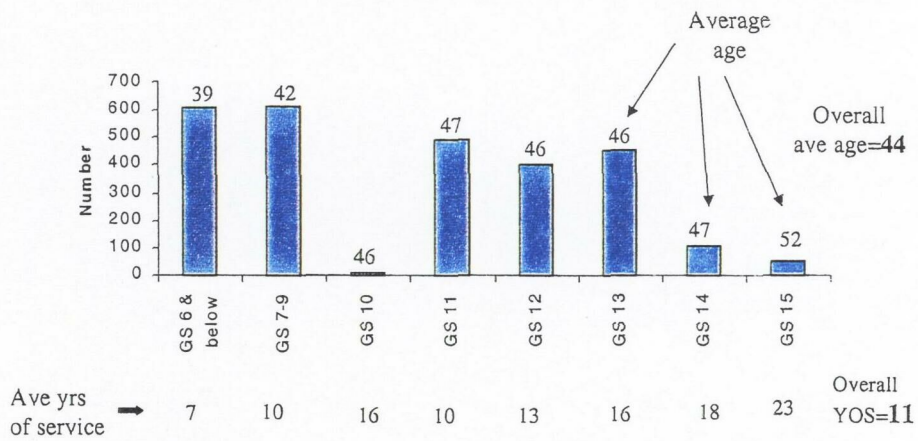
the analysis and change at the same time that the HR community is needed to implement the results of strategic sourcing analysis of other occupations. Therefore, we recommend that HR strategic sourcing be delayed until most other strategic sourcing personnel actions are complete.

To ensure that new training programs are tailored properly for all occupations, and that recruiting programs are focused and tailored to the needs of the user, the Navy should create occupational leaders for major occupational groups to ensure that consistent recruiting and training standards are created and enforced for each discipline (similar to the DAWIA program for acquisition professionals).
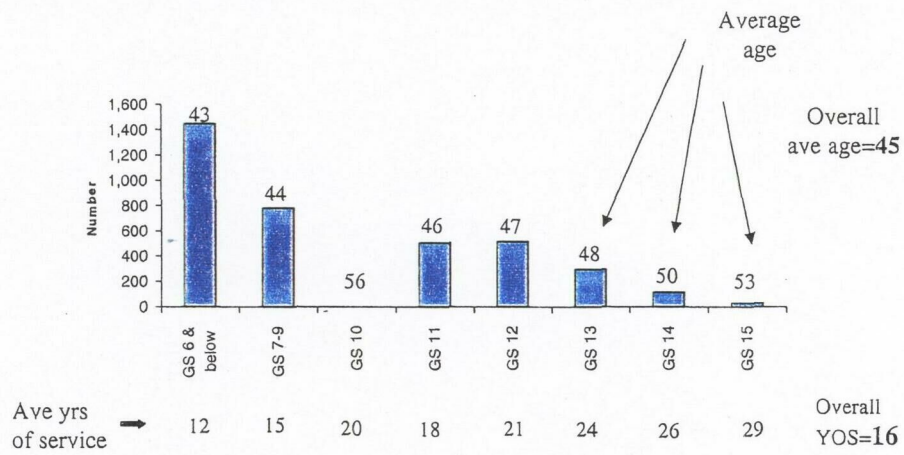
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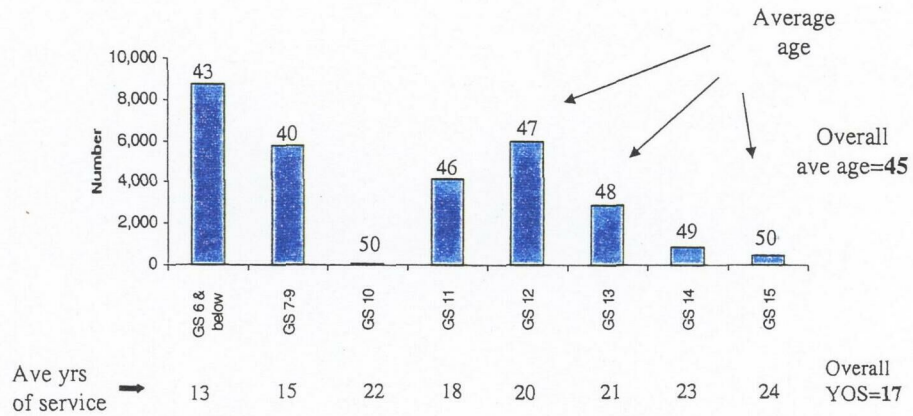# Appendix A: Occupational demographics

SOCIAL SCIENCES (Series 01xx)

Ave yrs of service → 7 10 16 10 13 16 18 23   Overall YOS=**11**

PERSONNEL MANAGEMENT (Series 02xx)

Ave yrs of service → 12 15 20 18 21 24 26 29   Overall YOS=**16**

ADMIN & OFFICE SUPPORT (Series 03xx)

| Ave yrs of service ➡ | 13 | 15 | 22 | 18 | 20 | 21 | 23 | 24 | Overall YOS=**17** |

BIOLOGICAL SCIENCES (Series 04xx)

| Ave yrs of service ➡ | 3 | 13 | 26 | 16 | 14 | 15 | 19 | 20 | Overall YOS=**15** |

FIN ADMIN & PROGRAM (Series 05xx)

Average age

Overall ave age=**46**

46	45	52	46	46	47	48	49

Number

2,500 — 2,000 — 1,500 — 1,000 — 500 — 0

GS 6 & below | GS 7-9 | GS 10 | GS 11 | GS 12 | GS 13 | GS 14 | GS 15

Ave yrs of service → 14   15   19   18   20   21   23   25   Overall YOS=**17**
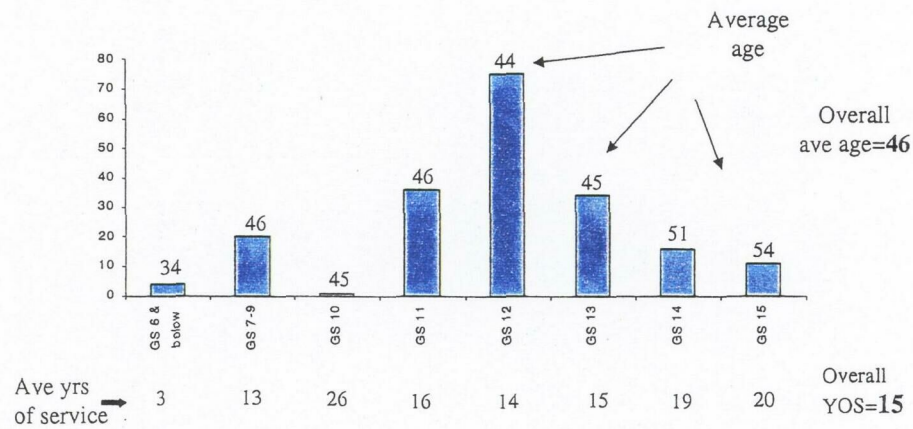
MED & HEALTH SCI (Series 06xx)

Average age

Overall ave age=**46**

	45	43	47	46	50	54	54

Number

2,000 — 1,500 — 1,000 — 500 — 0

GS 6 & below | GS 7-9 | GS 10 | GS 11 | GS 12 | GS 13 | GS 14 | GS 15

Ave yrs of service → 12   11   12   12   13   15   18   14   Overall YOS=**12**

80

ENGINEER & ARCHITECT (Series 08xx)

Average age

Overall ave age=**44**

	25	41	47	46	44	44	47	51

Number

12,000
10,000
8,000
6,000
4,000
2,000
0

GS 6 & below · GS 7-9 · GS 10 · GS 11 · GS 12 · GS 13 · GS 14 · GS 15

Ave yrs of service ➡ 2 · 13 · 20 · 19 · 17 · 18 · 22 · 26 · Overall YOS=**18**

LEGAL (Series 09xx)

Average age

Overall ave age=**44**

Number

400
350
300
250
200
150
100
50
0

44	44	46	45	39	41	44	47

GS 6 & below · GS 7-9 · GS 10 · GS 11 · GS 12 · GS 13 · GS 14 · GS 15

Ave yrs of service ➡ 13 · 16 · 22 · 17 · 8 · 9 · 14 · 17 · Overall YOS=**14**
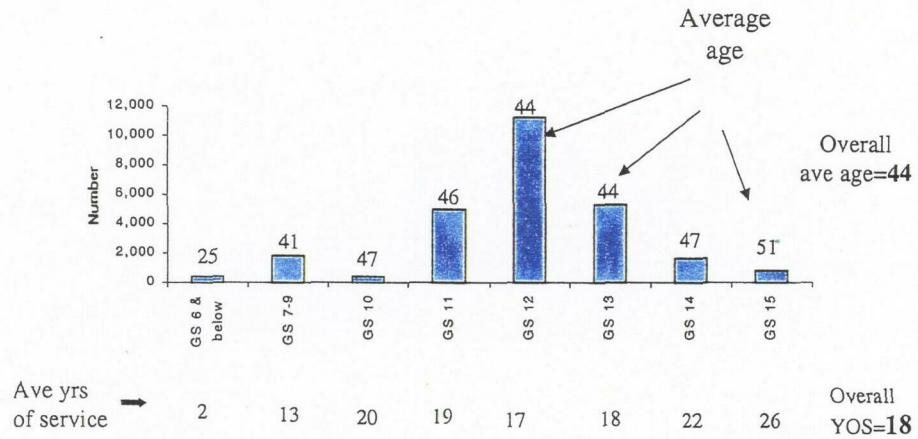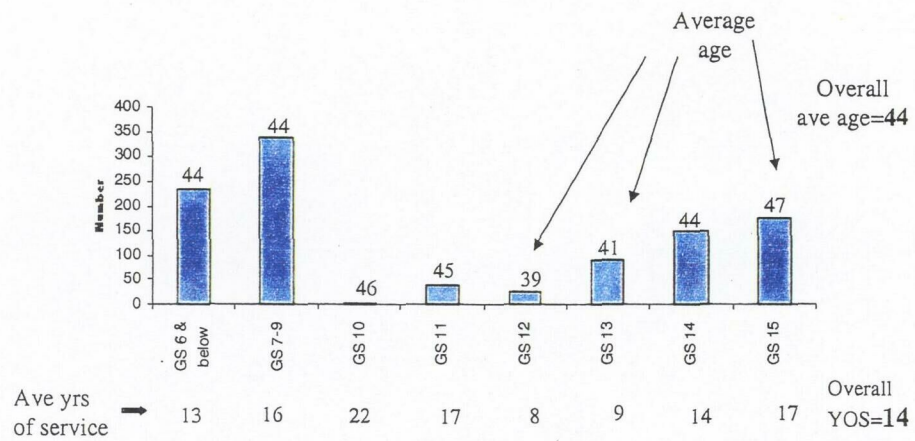
ARTS & INFORMATION (Series 10xx)

Average age

Overall
ave age=**47**

	GS 6 & below	GS 7-9	GS 10	GS 11	GS 12	GS 13	GS 14	GS 15	
Average age	43	46	48	47	49	50	54	52	
Ave yrs of service	13	16	24	18	20	21	24	23	Overall YOS=**18**
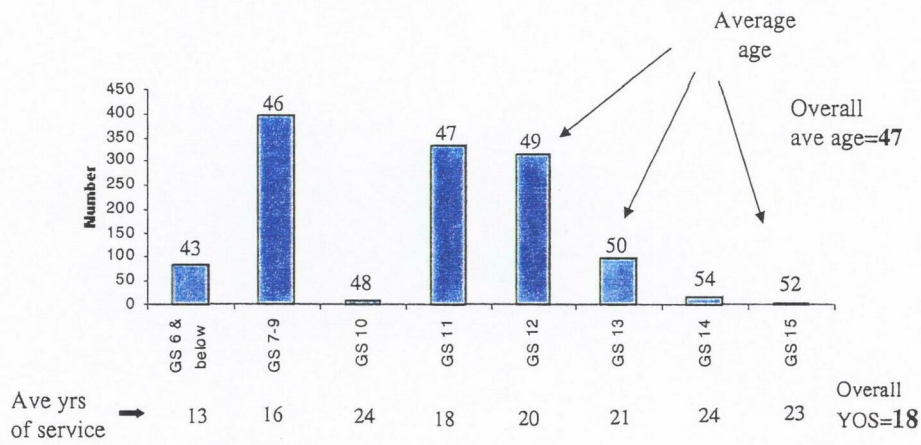
BUSINESS & INDUSTRY (Series 11xx)

Average age

Overall
ave age=**46**

	GS 6 & below	GS 7-9	GS 10	GS 11	GS 12	GS 13	GS 14	GS 15	
Average age	44	42	47	47	47	46	47	49	
Ave yrs of service	13	15	21	20	21	20	22	24	Overall YOS=**19**
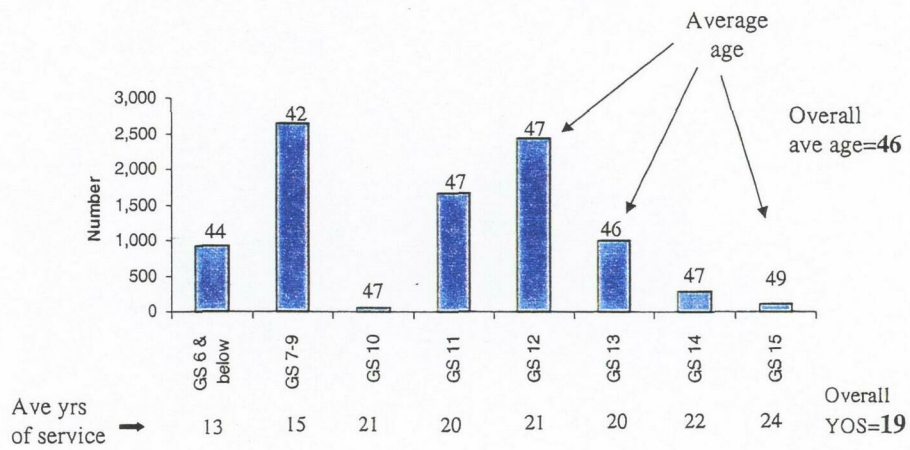
COPYRIGHT & PATENT (Series 12xx)

Average age

Overall ave age=**54**

					52	53	57
GS 6 & below	GS 7-9	GS 10	GS 11	GS 12	GS 13	GS 14	GS 15

Ave yrs of service →   19   15   23   Overall YOS=**18**
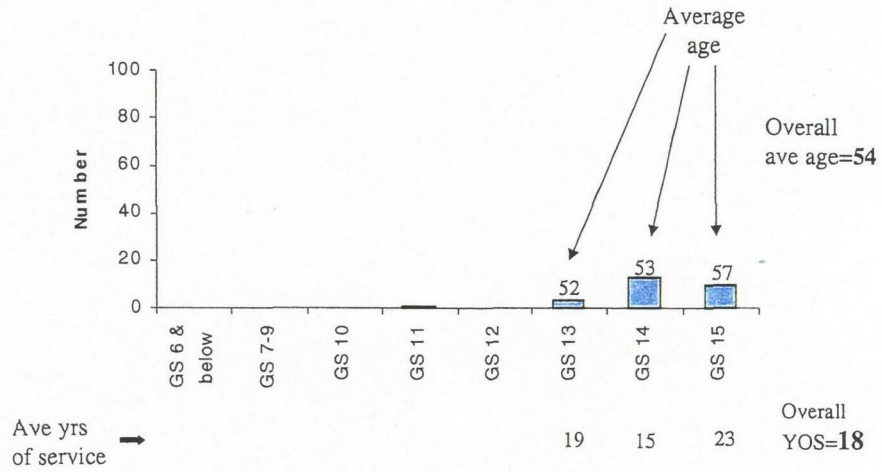
PHYSICAL SCIENCES (Series 13xx)

Average age

Overall ave age=**45**

	29	43	43	43	44	46	50	54
GS 6 & below	GS 7-9	GS 10	GS 11	GS 12	GS 13	GS 14	GS 15	

Ave yrs of service →   5   13   18   14   16   16   20   23   Overall YOS=**16**
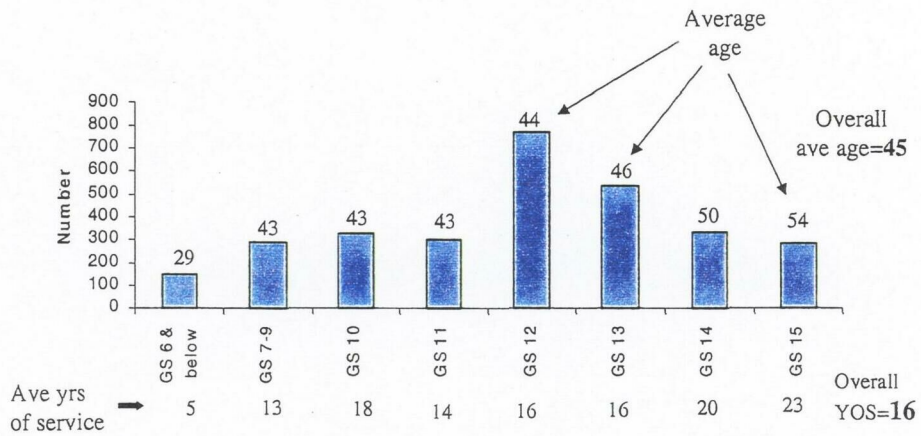
LIBRARY SCI & ARCHIVE (Series 14xx)

Average age

Overall ave age=**48**

44	41		50	51	51	59	

Number: 180 160 140 120 100 80 60 40 20 0

GS 6 & below | GS 7-9 | GS 10 | GS 11 | GS 12 | GS 13 | GS 14 | GS 15

Ave yrs of service → 12 15   18 19 20 30   Overall YOS=**16**
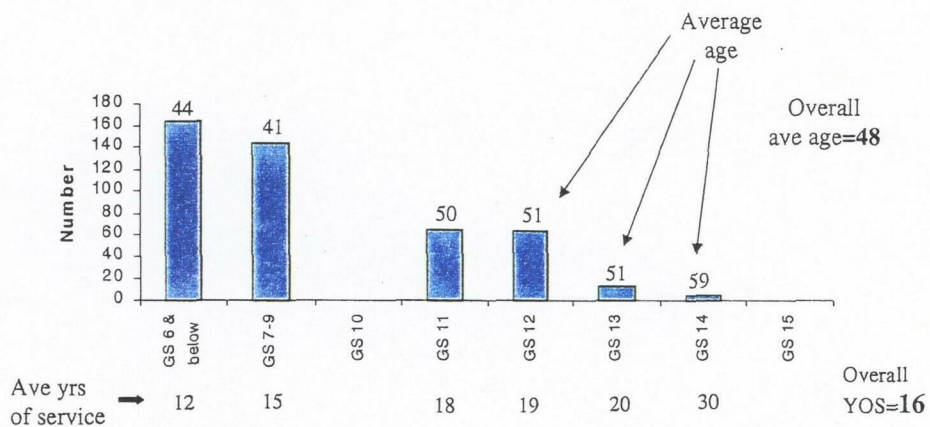
MATH & STATISTICIANS (Series 15xx)

Average age

Overall ave age=**42**

Number: 600 500 400 300 200 100 0

| 25 | 33 | 56 | 36 | 42 | 43 | 47 | 51 |

GS 6 & below | GS 7-9 | GS 10 | GS 11 | GS 12 | GS 13 | GS 14 | GS 15

Ave yrs of service → 2 5 28 7 14 15 20 23   Overall YOS=**14**
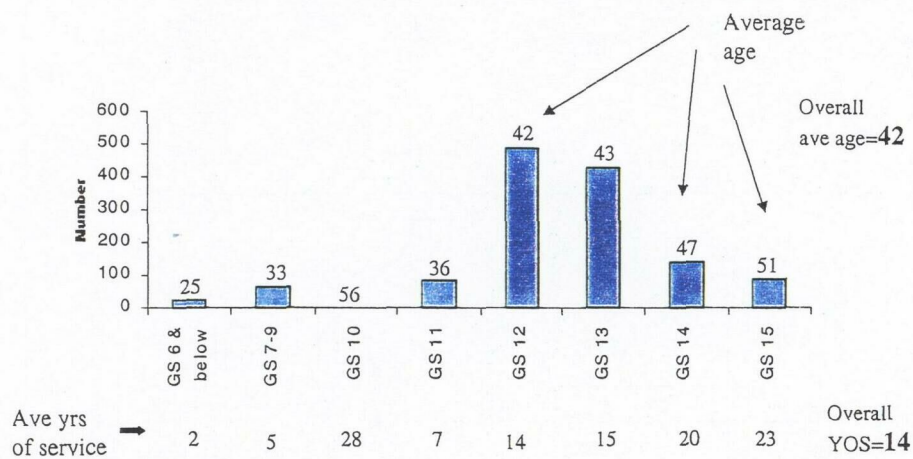
EQUIP & FACILITY MGMT (Series 16xx)

Average age

Overall ave age=**49**

| Ave yrs of service → | 13 | 20 | 26 | 21 | 23 | 25 | 26 | 28 | Overall YOS=**22** |
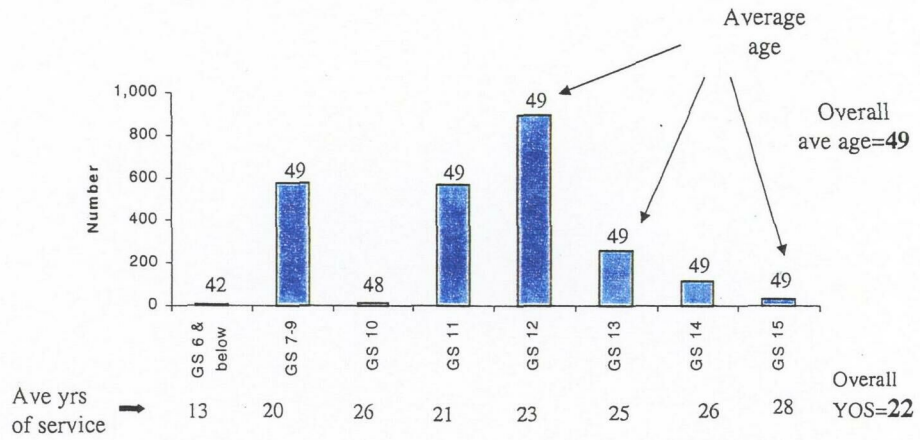
EDUCATION AND TRAINING (Series 17xx)

Average age

Overall ave age=**45**

| Ave yrs of service → | 8 | 12 | | 16 | 17 | 20 | 22 | 26 | Overall YOS=**12** |
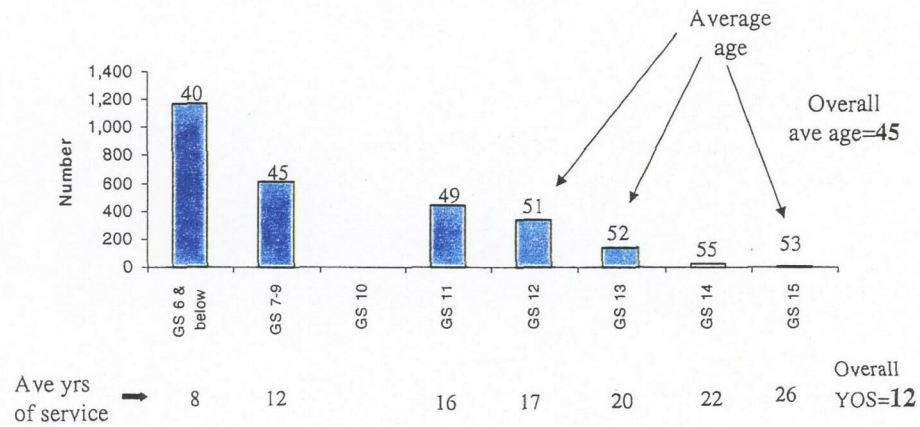
INVESTIGATION AND COMPLIANCE
(Series 18xx)

Average age

Overall ave age=**43**

| Ave yrs of service ➡ | 13 | 10 | | 8 | 13 | 17 | 21 | 23 | Overall YOS=**15** |
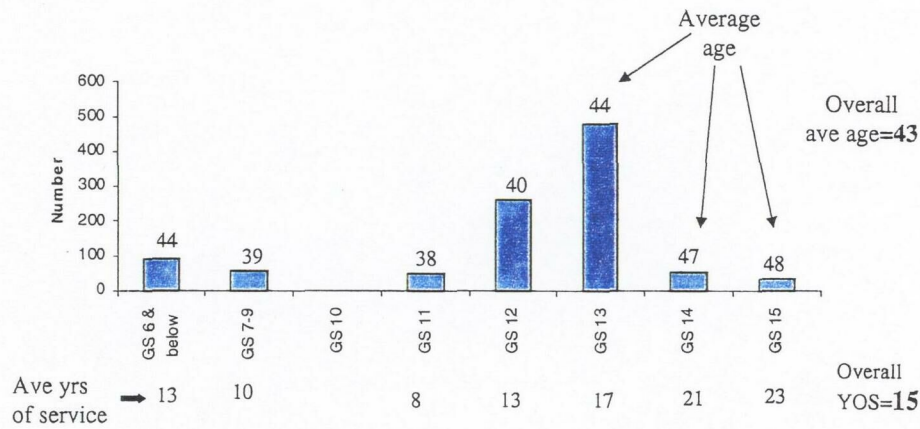
QUALITY INSPECTION (Series 19xx)

Average age

Overall ave age=**49**

| Ave yrs of service ➡ | 11 | 21 | 24 | 23 | 24 | 26 | 30 | 31 | Overall YOS=**23** |

SUPPLY (Series 20xx)

| Ave yrs of service ➜ | 16 | 19 | 21 | 21 | 22 | 22 | 24 | 25 | Overall YOS=**19** |
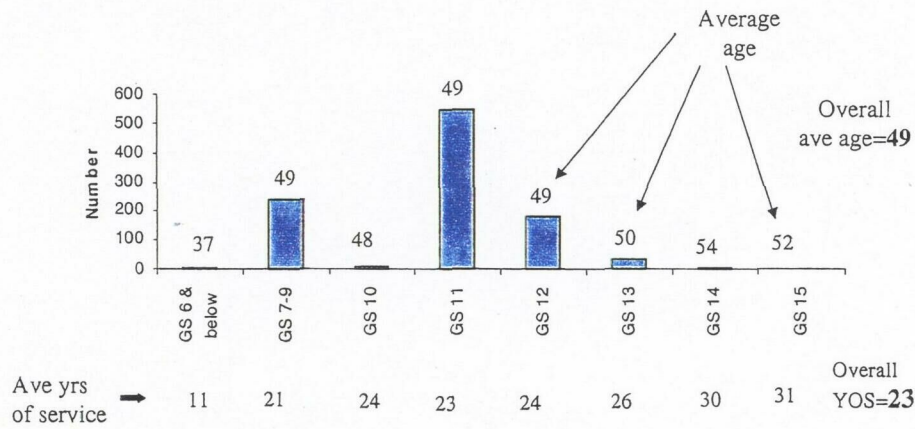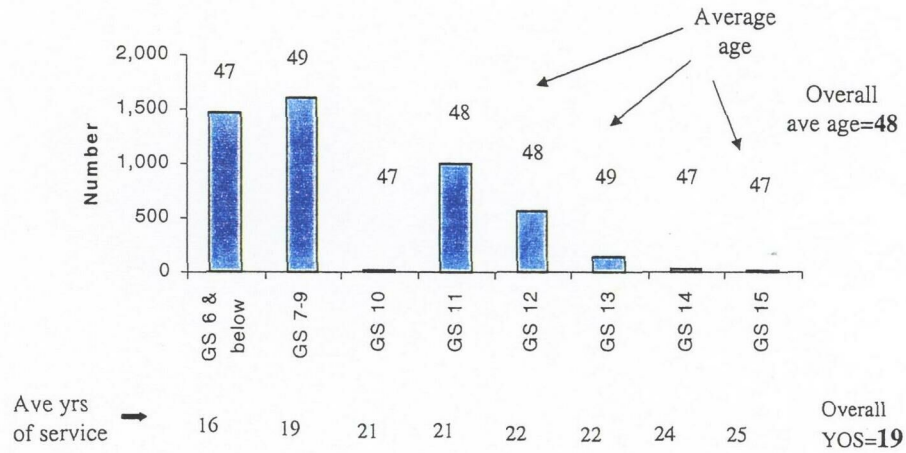
TRANSPORTATION (Series 21xx)

| Ave yrs of service ➜ | 15 | 16 | 20 | 19 | 18 | 20 | 22 | 20 | Overall YOS=**17** |
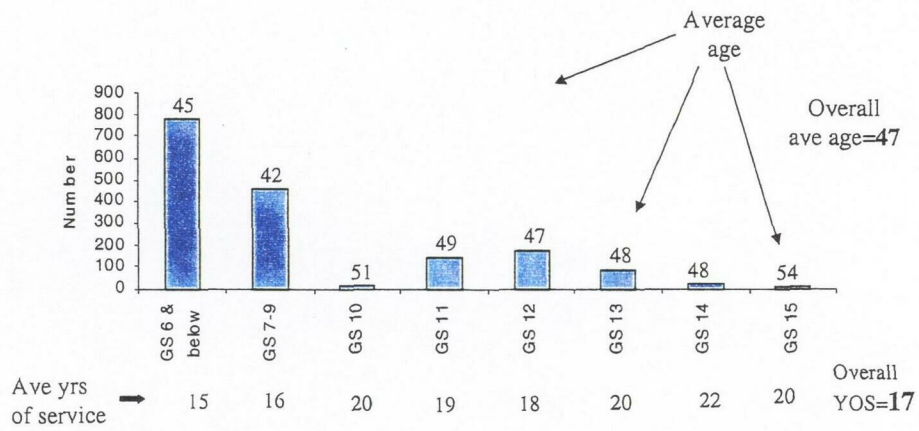
MISCELLANEOUS OCCUPATIONS

Average age

Overall ave age=**44**

| Ave yrs of service → | 12 | 16 | 22 | 18 | 19 | 20 | 22 | 28 | Overall YOS=**15** |
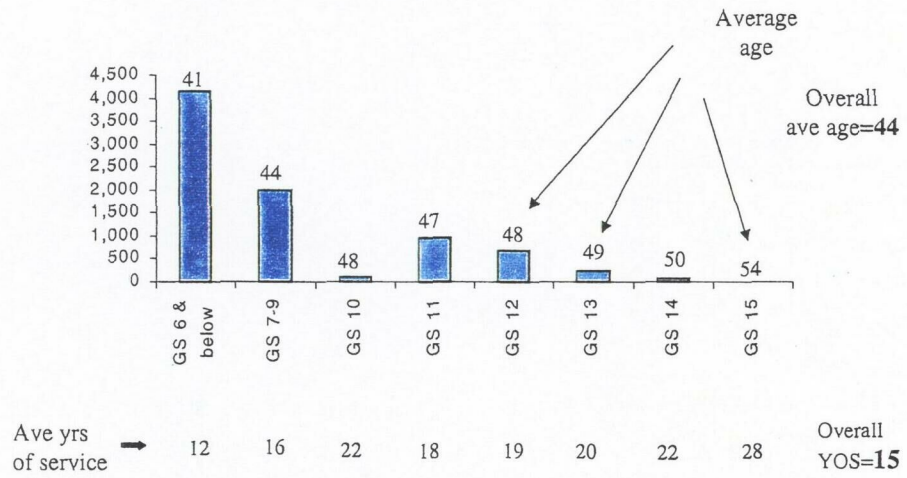
Appendix B: Civil Service General Schedule of Occupations

GENERAL SCHEDULE

Service Occ.	Title
0006	Correctional Institution Administration
0007	Correctional Officer
0011	Bond Sales Promotion
0018	Safety & Occupational Health Management
0019	Safety Technician
0020	Community Planning
0021	Community Planning Technician
0023	Outdoor Recreation Planning
0025	Park Ranger
0026	Park Technician
0028	Environmental Protection Specialist
0029	Environmental Protection Assistant
0030	Sports Specialist
0032	Office Automation Clerical and Assistance
0050	Funeral Directing
0060	Chaplain
0062	Clothing Design
0072	Fingerprint Identification
0080	Security Administration
0081	Fire Protection & Prevention
0082	United States Marshal
0083	Police
0085	Guard
0086	Security Clerical & Assistance
0090	Guide
0095	Foreign Law Specialist
0099	General Science Student Trainee
0100	Interior Design
0101	Social Science
0102	Social Science Aid & Technician
0105	Social Insurance Administration
0106	Unemployment Insurance
0110	Economist
0119	Economics Assistant
0120	Food Assistance Program Specialist
0130	Foreign Affairs
0131	International Relations
0132	Intelligence
0134	Intelligence Aid & Clerk
0135	Foreign Agricultural Affairs
0136	International Cooperation
0140	Manpower Research & Analysis
0142	Manpower Development
0150	Geography
0160	Civil Rights Analysis
0170	History
0180	Psychology
0181	Psychology Aid & Technician
0184	Sociology
0185	Social Work
0186	Social Services Aid & Assistant

GENERAL SCHEDULE

Service Occ.	Title
0187	Social Services
0188	Recreation
0189	Recreation Aid & Assistant
0190	General Anthropology
0193	Archeology
0199	Social Science Student Trainee
0201	Personnel Management
0203	Personnel Clerical & Assistance
0204	Military Personnel Clerical & Technician
0205	Military Personnel Management
0212	Personnel Staffing
0221	Position–Classification
0222	Occupational Analysis
0223	Salary & Wage Administration
0230	Employee Relations
0233	Labor Relations
0235	Employee Development
0241	Mediation
0243	Apprenticeship & Training
0244	Labor Management Relations Examining
0246	Contractor Industrial Relations
0249	Wage & Hour Compliance
0260	Equal Employment Opportunity
0299	Personnel Management Student Trainee
0301	Miscellaneous Administration & Program
0302	Messenger
0303	Miscellaneous Clerk & Assistant
0304	Information Receptionist
0305	Mail & File
0309	Correspondence Clerk
0312	Clerk–Stenographer & Reporter
0313	Work Unit Supervising
0318	Secretary
0319	Closed Microphone Reporter
0322	Clerk–Typist
0332	Computer Operation
0334	Computer Specialist
0335	Computer Clerk & Assistant
0340	Program Management
0341	Administrative Officer
0342	Support Services Administration
0343	Management Analysis
0344	Management Clerical & Assistance
0345	Program Analysis
0346	Logistics Management
0350	Equipment Operator
0351	Printing Clerical
0356	Data Transcriber
0357	Coding
0359	Electric Accounting Machine Operation
0360	Equal Opportunity Compliance

GENERAL SCHEDULE

Service Occ.	Title
0361	Equal Opportunity Assistance
0362	Electric Accounting Machine Project Planning
0382	Telephone Operating
0385	Teletypist
0388	Cryptographic Equipment Operation
0389	Radio Operating
0390	Communications Relay Operation
0391	Communications Management
0392	General Communications
0393	Communications Specialist
0394	Communications Clerical
0399	Administration and Office Support Student Trainee
0401	General Biological Science
0403	Microbiology
0404	Biological Technician
0405	Pharmacology
0406	Agricultural Extension
0408	Ecology
0410	Zoology
0413	Physiology
0414	Entomology
0415	Toxicology
0421	Plant Protection Technician
0430	Botany
0434	Plant Pathology
0435	Plant Physiology
0436	Plant Protection & Quarantine
0437	Horticulture
0440	Genetics
0454	Range Conservation
0455	Range Technician
0457	Soil Conservation
0458	Soil Conservation Technician
0459	Irrigation System Operation
0460	Forestry
0462	Forestry Technician
0470	Soil Science
0471	Agronomy
0475	Agricultural Management
0480	General Fish & Wildlife Administration
0482	Fishery Biology
0485	Wildlife Refuge Management
0486	Wildlife Biology
0487	Animal Science
0493	Home Economics
0499	Biological Science Student Trainee
0501	Financial Administration & Program
0503	Financial Clerical & Assistance
0505	Financial Management
0510	Accounting
0511	Auditing

GENERAL SCHEDULE

Service Occ.	Title
0512	Internal Revenue Agent
0525	Accounting Technician
0526	Tax Technician
0530	Cash Processing
0540	Voucher Examining
0544	Payroll
0545	Military Pay
0560	Budget Analysis
0561	Budget Clerical & Assistance
0570	Financial Institution Examining
0590	Time & Leave
0592	Tax Examining
0593	Insurance Accounts
0599	Accounting Student Trainee
0601	General Health Science
0602	Medical Officer
0610	Nurse
0620	Practical Nurse
0621	Nursing Assistant
0622	Medical Supply Aide & Technician
0625	Autopsy Assistant
0630	Dietitian & Nutritionist
0631	Occupational Therapist
0633	Physical Therapist
0635	Corrective Therapist
0636	Rehabilitation Therapy Assistant
0637	Manual Arts Therapist
0638	Recreation/Creative Arts Therapist
0639	Educational Therapist
0640	Health Aid & Technician
0642	Nuclear Medicine Technician
0644	Medical Technologist
0645	Medical Technician
0646	Pathology Technician
0647	Diagnostic Radiologic Technologist
0648	Therapeutic Radiologic Technologist
0649	Medical Machine Technician
0650	Medical Technical Assistant
0651	Respiratory Therapist
0660	Pharmacist
0661	Pharmacy Technician
0662	Optometrist
0664	Restoration Technician
0665	Speech Pathology & Audiology
0667	Orthotist & Prosthetist
0668	Podiatrist
0669	Medical Record Librarian
0670	Health System Administration
0671	Health System Specialist
0672	Prosthetic Representative
0673	Hospital Housekeeping Management

GENERAL SCHEDULE

Service Occ.	Title
0675	Medical Record Technician
0679	Medical Clerk
0680	Dental Officer
0681	Dental Assistant
0682	Dental Hygiene
0683	Dental Laboratory Aid & Technician
0685	Public Health Program Specialist
0688	Sanitarian
0690	Industrial Hygiene
0696	Consumer Safety
0698	Environmental Health Technician
0699	Medical & Health Student Trainee
0701	Veterinary Medical Science
0704	Animal Health Technician
0799	Veterinary Student Trainee
0801	General Engineering
0802	Engineering Technician
0803	Safety Engineering
0804	Fire Prevention Engineering
0805	Engineering Technology
0806	Materials Engineering
0807	Landscape Architecture
0808	Architecture
0809	Construction Control
0810	Civil Engineering
0817	Surveying Technician
0818	Engineering Drafting
0819	Environmental Engineering
0828	Construction Analyst
0830	Mechanical Engineer
0840	Nuclear Engineering
0850	Electrical Engineering
0854	Computer Engineering
0855	Electronics Engineering
0856	Electronics Technician
0858	Biomedical Engineering
0861	Aerospace Engineering
0871	Naval Architecture
0873	Ship Surveying
0880	Mining Engineering
0881	Petroleum Engineering
0890	Agricultural Engineering
0892	Ceramic Engineering
0893	Chemical Engineering
0894	Welding Engineering
0895	Industrial Engineering Technician
0896	Industrial Engineering
0899	Engineering & Architecture Student Trainee
0904	Law Clerk
0905	General Attorney
0920	Estate Tax Examining

GENERAL SCHEDULE

Service Occ.	Title
0930	Hearings & Appeals
0935	Administrative Law Judge
0942	Deportation & Exclusion Examining
0945	Clerk of Court
0950	Paralegal Specialist
0962	Contact Representative
0963	Legal Instruments Examining
0965	Land Law Examining
0967	Passport & Visa Examining
0986	Legal Clerk & Technician
0987	Tax Law Specialist
0990	General Claims Examining
0991	Workers' Compensation Claims Examining
0992	Loss & Damage Claims Examining
0993	Social Insurance Claims Examining
0994	Unemployment Compensation Claims Examining
0995	Dependents & Estates Claims Examining
0996	Veterans Claims Examining
0997	Civil Service Retirement Claims Examining
0998	Claims Clerical
0999	Legal Occupations Student Trainee
1001	General Arts & Information
1010	Exhibits Specialist
1015	Museum Curator
1016	Museum Specialist & Technician
1020	Illustrating
1021	Office Drafting
1035	Public Affairs
1040	Language Specialist
1046	Language Clerical
1048	Foreign Language Broadcasting
1051	Music Specialist
1054	Theater Specialist
1056	Art Specialist
1060	Photography
1071	Audio-Visual Production
1082	Writing & Editing
1083	Technical Writing & Editing
1084	Visual Information
1087	Editorial Assistance
1099	Information and Arts Student Trainee
1101	General Business & Industry
1102	Contracting
1103	Industrial Property Management
1104	Property Disposal
1105	Purchasing
1106	Procurement Clerical & Assistance
1107	Property Disposal Clerical & Technician
1130	Public Utilities Specialist
1140	Trade Specialist
1144	Commissary Store Management

GENERAL SCHEDULE

Service Occ.	Title
1145	Agricultural Program Specialist
1146	Agricultural Marketing
1147	Agricultural Market Reporting
1149	Wage & Hour Law Administration
1150	Industrial Specialist
1152	Production Control
1160	Financial Analysis
1161	Crop Insurance Administration
1162	Crop Insurance Underwriting
1163	Insurance Examining
1165	Loan Specialist
1169	Internal Revenue Officer
1170	Realty
1171	Appraising & Assessing
1173	Housing Management
1176	Building Management
1199	Business and Industry Student Trainee
1202	Patent Technician
1210	Copyright
1211	Copyright Technician
1220	Patent Administration
1221	Patent Adviser
1222	Patent Attorney
1223	Patent Classifying
1224	Patent Examining
1225	Patent Interference Examining
1226	Design Patent Examining
1299	Copyright and Patent Student Trainee
1301	General Physical Science
1306	Health Physics
1310	Physics
1311	Physical Science Technician
1313	Geophysics
1315	Hydrology
1316	Hydrologic Technician
1320	Chemistry
1321	Metallurgy
1330	Astronomy & Space Science
1340	Meteorology
1341	Meteorological Technician
1350	Geology
1360	Oceanography
1361	Navigational Information
1370	Cartography
1371	Cartographic Technician
1372	Geodesy
1373	Land Surveying
1374	Geodetic Technician
1380	Forest Products Technology
1382	Food Technology
1384	Textile Technology

96

GENERAL SCHEDULE

Service Occ.	Title
1386	Photographic Technology
1397	Document Analysis
1399	Physical Science Student Trainee
1410	Librarian
1411	Library Technician
1412	Technical Information Services
1420	Archivist
1421	Archives Technician
1499	Library and Archives Student Trainee
1510	Actuary
1515	Operations Research
1520	Mathematics
1521	Mathematics Technician
1529	Mathematical Statistician
1530	Statistician
1531	Statistical Assistant
1540	Cryptography
1541	Cryptanalysis
1550	Computer Science
1599	Mathematical Science Student Trainee
1601	General Facilities & Equipment
1630	Cemetery Administration
1640	Facility Management
1654	Printing Management
1658	Laundry & Dry Cleaning Plant Management
1667	Steward
1670	Equipment Specialist
1699	Equipment and Facilities Management Student Trainee
1701	General Education & Training
1702	Education & Training Technician
1710	Education & Vocational Training
1712	Training Instruction
1715	Vocational Rehabilitation
1720	Education Program
1722	School Administration
1724	Elementary Teaching
1725	Public Health Educator
1726	Secondary Teaching
1728	Special Education
1730	Education Research
1740	Education Services
1750	Instructional Systems
1755	Vocational-Technical Instruction
1799	Education Student Trainee
1801	General Inspection, Investigation, & Compliance
1802	Compliance Inspection & Support
1810	General Investigating
1811	Criminal Investigating
1812	Game Law Enforcement
1815	Air Safety Investigating
1816	Immigration Inspection

GENERAL SCHEDULE

Service Occ.	Title
1822	Mine Safety & Health
1825	Aviation Safety Officer
1831	Securities Compliance Examining
1850	Agricultural Commodity Warehouse Examining
1854	Alcohol, Tobacco & Firearms Inspection
1855	Alcohol Tax Technician
1862	Consumer Safety Inspection
1863	Food Inspection
1864	Public Health Quarantine Inspection
1884	Customs Patrol Officer
1889	Import Specialist
1890	Customs Inspection
1892	Customs Appraising & Examining
1894	Customs Entry & Liquidating
1895	Customs Warehouse Officer
1896	Border Patrol Agent
1897	Customs Aid
1898	Admeasurement
1899	Investigation Student Trainee
1910	Quality Assurance
1980	Agricultural Commodity Grading
1981	Agricultural Commodity Aid
1999	Quality Inspection Student Trainee
2001	General Supply
2003	Supply Program Management
2005	Supply Clerical & Technician
2010	Inventory Management
2030	Distribution Facilities & Storage Management
2032	Packaging
2050	Supply Cataloging
2091	Sales Store Clerical
2099	Supply Student Trainee
2101	Transportation Specialist
2102	Transportation Clerk & Assistant
2110	Transportation Industry Analysis
2111	Transportation Rate & Tariff Examining
2121	Railroad Safety
2123	Motor Carrier Safety
2125	Highway Safety
2130	Traffic Management
2131	Freight Rate
2132	Travel
2133	Passenger Rate
2134	Shipment Clerical and Assistance
2135	Transportation Loss & Damage Claims Examining
2144	Cargo Scheduling
2150	Transportation Operations
2151	Dispatching
2152	Air Traffic Control
2154	Air Traffic Assistance
2161	Marine Cargo

GENERAL SCHEDULE

Service Occ.	Title
2181	Aircraft Operation
2183	Air Navigation
2185	Air Crew Technician
2199	Transportation Student Trainee

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Appendix C: Number of employees and average grade by occupation

Average Grade for
ENGINEERS & ARCHITECTS
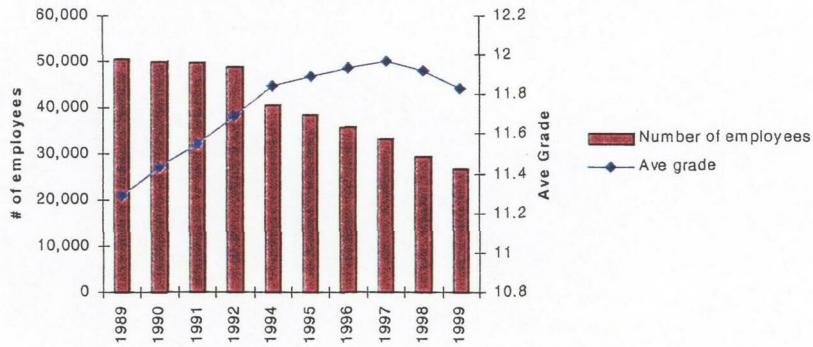
Average Grade for
ADMINISTRATION & OFFICE SUPPORT
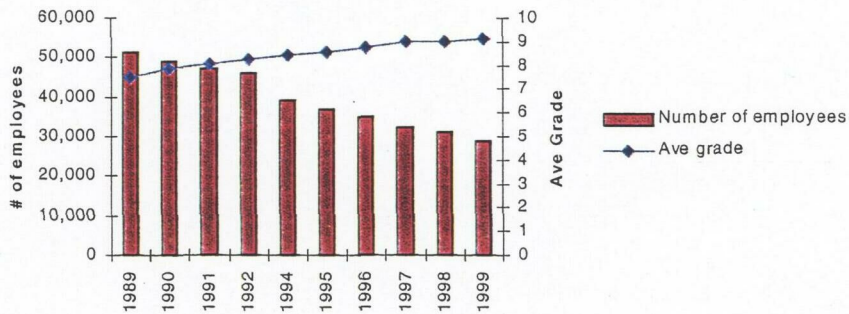
Average Grade for
BUSINESS & INDUSTRY
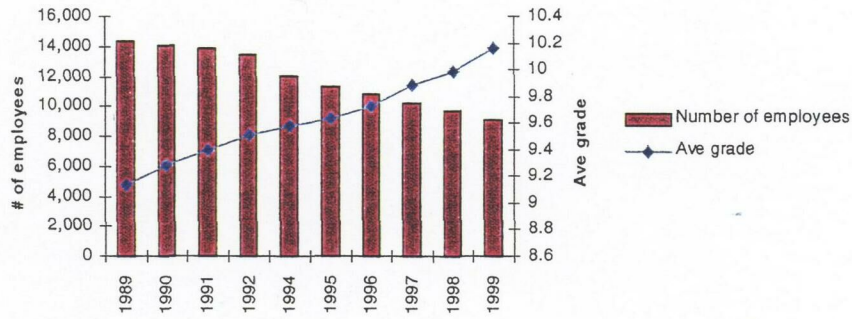
Average Grade for
BUSINESS & INDUSTRY
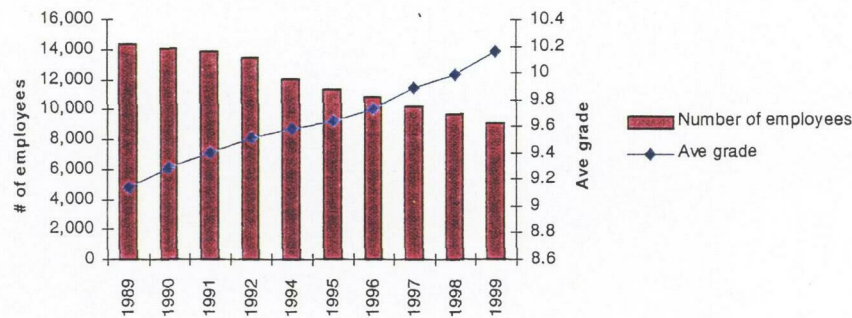
Average Grade for
SUPPLY
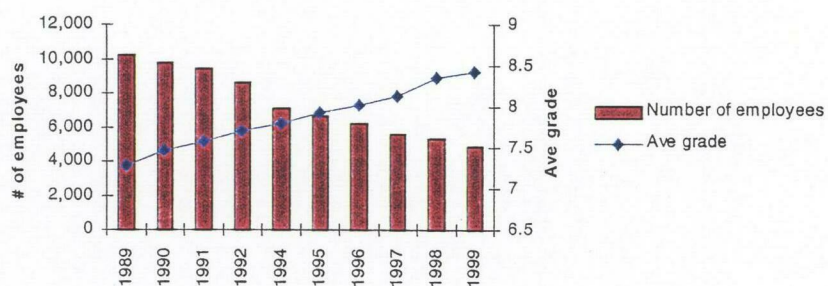
Average Grade for
MEDICAL & HEALTH SCIENCES
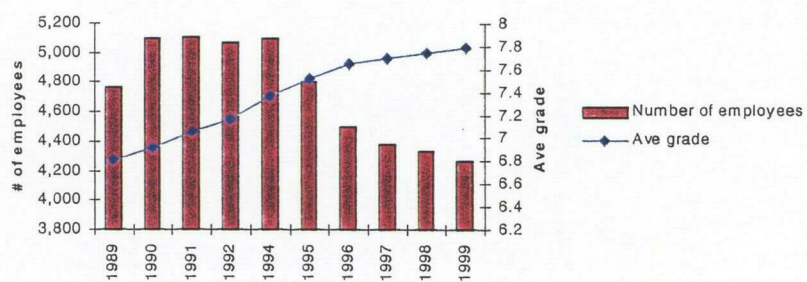
Average Grade for
PHYSICAL SCIENCES
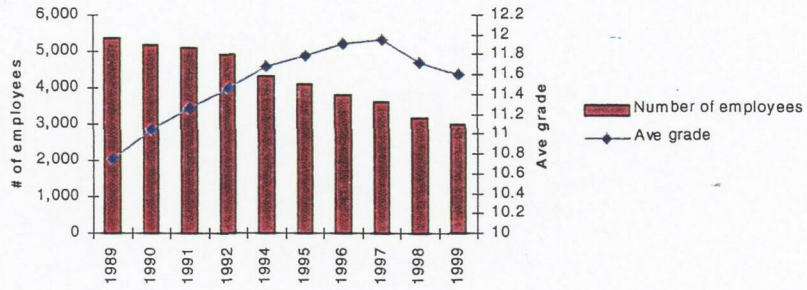
Average Grade for
PERSONNEL MANAGEMENT
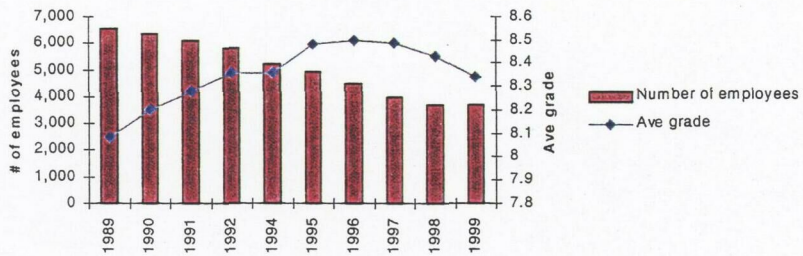
Average Grade for
EDUCATION
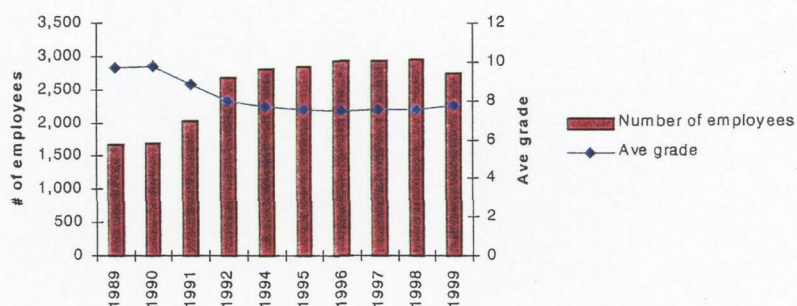
Average Grade for
MATHEMATICS & STATISTICAL SCIENCES
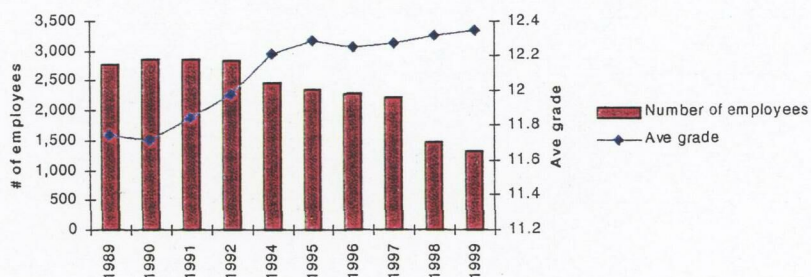
Appendix D: Female and minority representation by function

Minorities and Females Representation
Professional
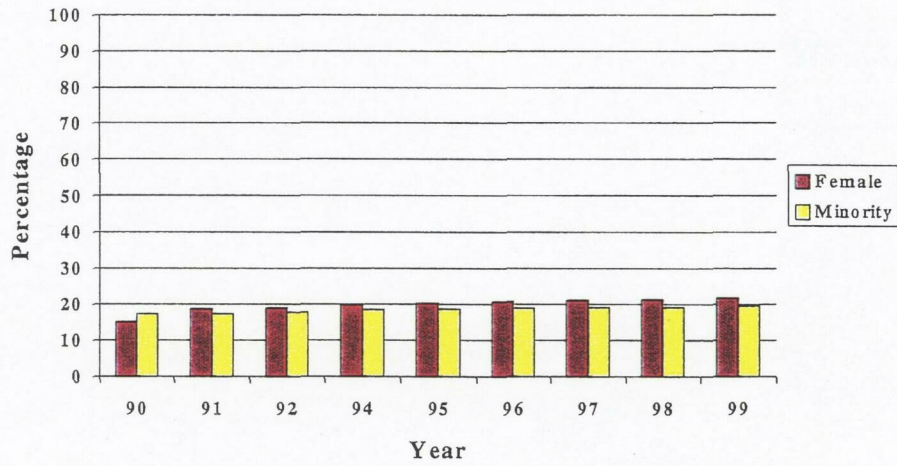
Minorities and Females Representation
Administration & Office support
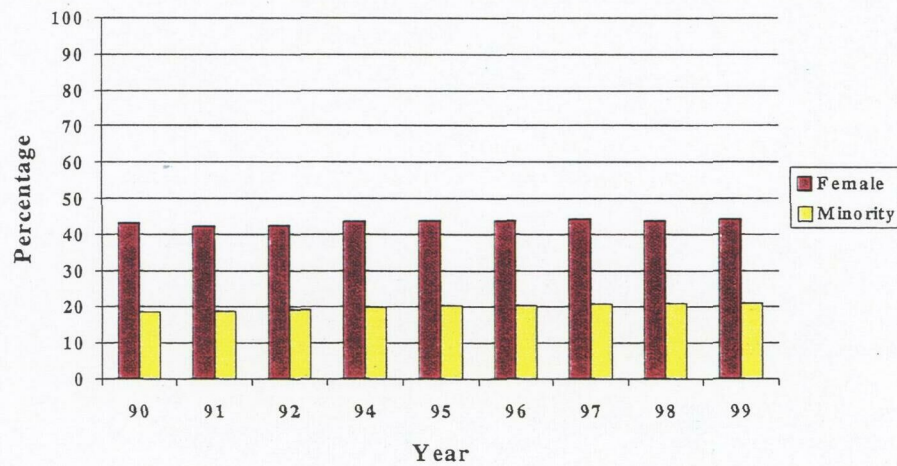
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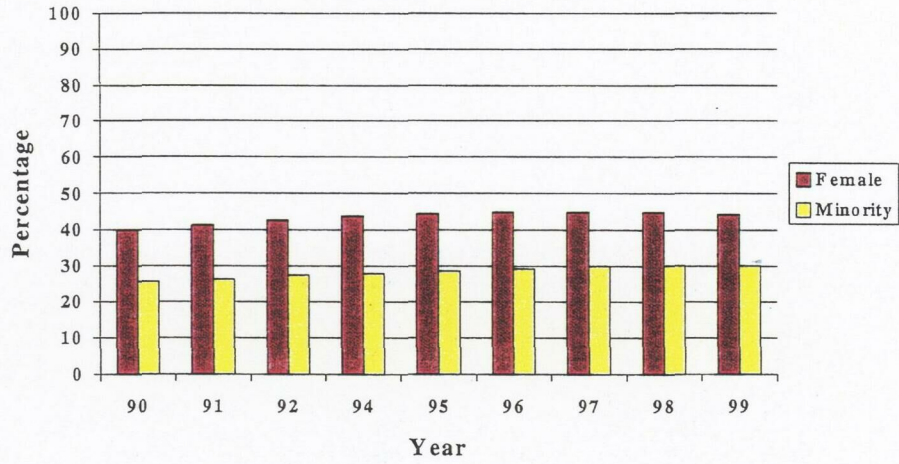
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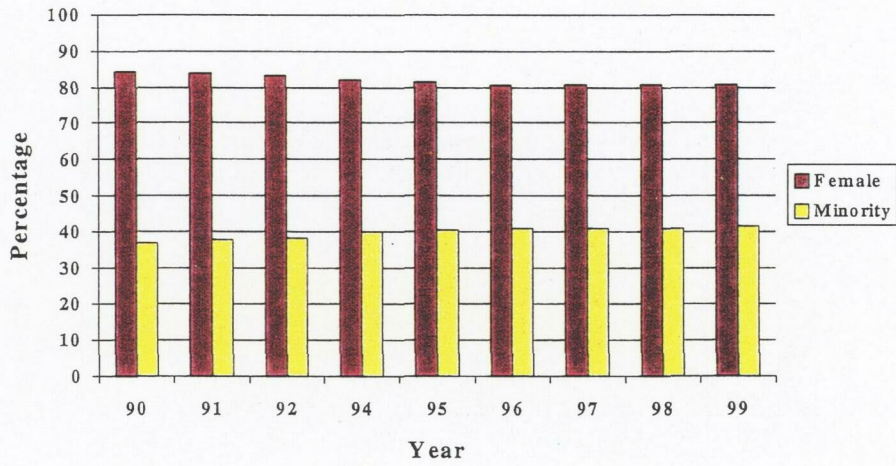
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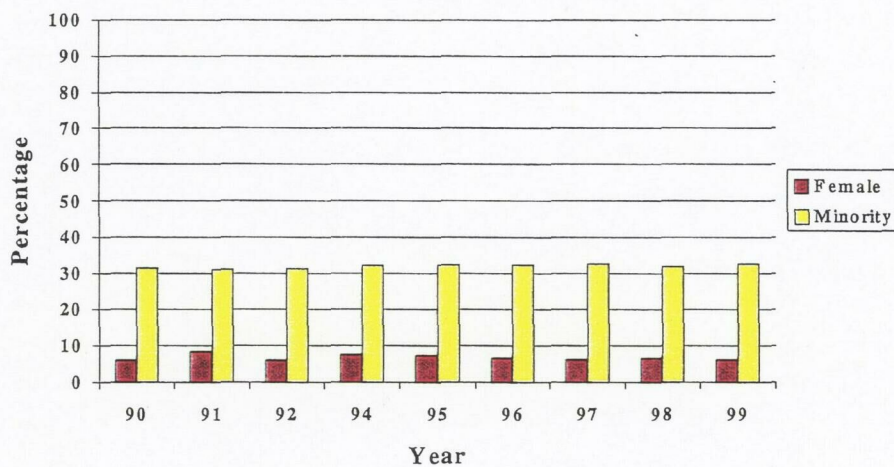
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Blue Collar
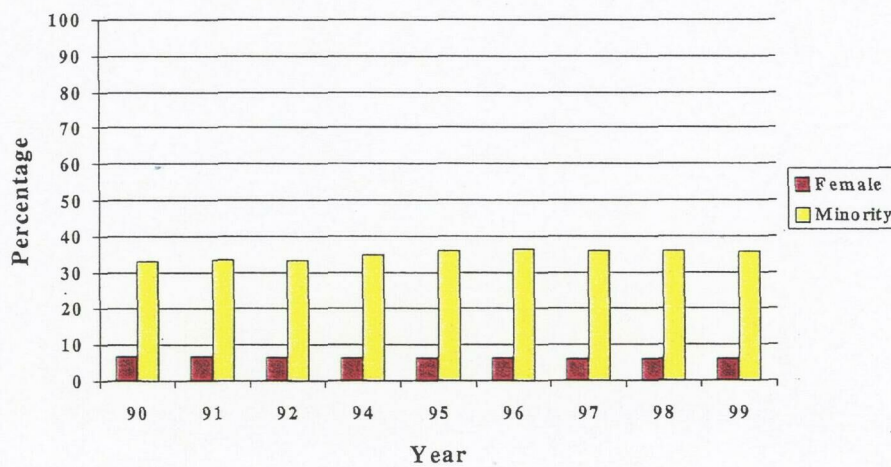
Appendix E: Senior Executive Survey

Navy Human Resources SES Survey

The Center for Naval Analyses is conducting a study for the USN on the Navy's civil service workforce. Part of the study requires an analysis of future workforce requirements, alternative ways to provide for career development, and ways to provide a more flexible workforce. As a member of the Senior Executive Service, your personal views (which are confidential and not for attribution) would be of value to us in this study, to help focus our research.

1. Are you satisfied with your command's ability to recruit the people you need to achieve your mission?

   Dissatisfied ____   Moderately dissatisfied ____

   Moderately satisfied ____   Satisfied ____

2. What specialties are you having the most difficulty recruiting?

3. If you are satisfied /moderately satisfied with your command's recruiting, indicate any special recruiting programs or locations that are used, or provide a point of contact that can be contacted for further information.

4. If you are dissatisfied /moderately dissatisfied with your command's recruiting, what do you think might improve it (beyond the ability to offer higher starting pay)?

5. Does your command have a formal orientation/indoctrination program for new employees?

   Yes____   No____

6. What is the duration of the program?

7. After indoctrination, and not including DAWIA and EEO training, is any additional training mandatory for your white-collar workforce? If yes, in what areas?

8. It has been suggested that some sort of a formalized career development program, outlining certain minimum training/education requirements at various stages of an employee's

career, should be established for the IT, human resources, financial management, contracting, and legal communities. Ostensibly, minimum education and training requirements, and standards governing minimum requirements for advancement would be established for each discipline by a team of respected senior executives of that discipline. Also, career-broadening measures such as periodic rotation and perhaps cross-functional assignments would be encouraged if not required (the FM and legal communities currently have programs with some of these features). What do you think of this idea for your discipline? (Indicate your discipline or "specialty.")

Opposed ___ Neither favor nor oppose _ _ _In favor ___

No opinion/need more info ___

9. What do you think might be some of the major benefits/disadvantages of such a program?

10. Over 25% of the Department of the Navy's SES is currently eligible to retire. Some argue that this potential "brain drain" is a serious problem for the Navy of the future, but others think it is not serious because most will not retire when eligible. Further, even if they do, some contend that there are plenty of well-qualified replacements available in the DON that can take their place. What do you think?

    This is a serous problem ___

    This is not a serious problem because
        Few will retire when eligible ___
        There are plenty of qualified replacements ___
        Other ___

11. The average age of a Navy employee is nearly 46 years, up from 41 years in 1989. What do you think this "aging of the workforce" means to the Navy efficiency and productivity over the next ten years?

    Reduced efficiency or productivity ___
    Improved efficiency or productivity ___
    Probably does not affect efficiency or productivity ___

12. How many years after you are eligible to retire do you plan to retire? (If less than 6 months, indicate "0," 6-18 months indicate "1," 18-30 months, indicate "2," etc.)

13. What is your age?

14. Indicate command, name, title, and phone number/e-mail address (this is optional, but would be useful if we need any clarifying info on any of your replies. In any case, your replies will be held in strictest confidence and are not for attribution):

15. Additional comments?

Please deposit your completed return in the box provided or return to:

A. DiTrapani
CNA, 4401 Ford Ave.,
Alexandria, VA 22302
(Fax 703-824-2949/2264)

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