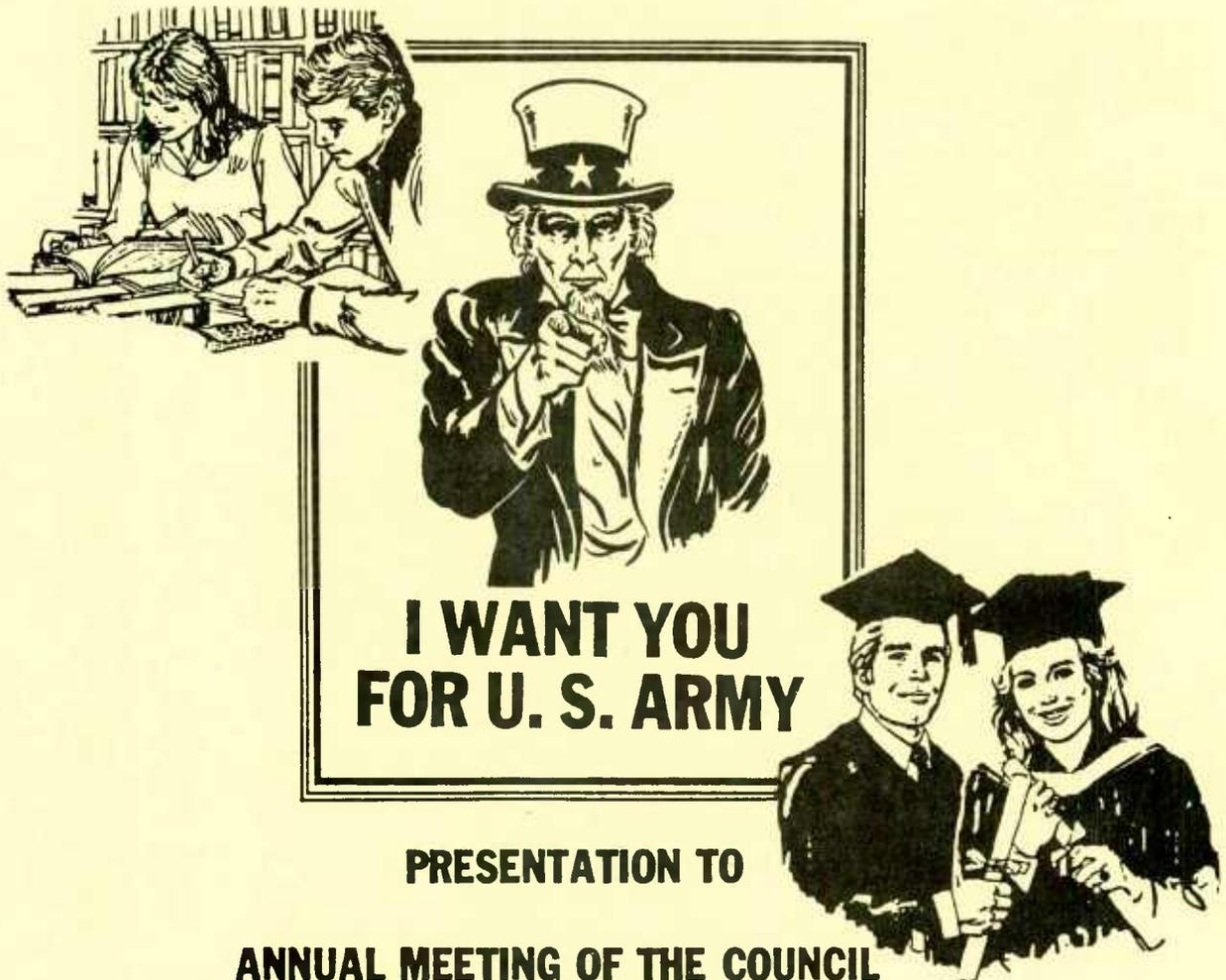


EDUCATION AND MILITARY MANPOWER REQUIREMENTS



**I WANT YOU
FOR U. S. ARMY**

PRESENTATION TO

**ANNUAL MEETING OF THE COUNCIL
OF CHIEF STATE SCHOOL OFFICERS**

**BY
JURI TOOMEPUU
NOVEMBER 15, 1986**

LOUISVILLE, KENTUCKY

EDUCATION AND MILITARY MANPOWER REQUIREMENTS

Presentation to
Annual Meeting of the Council
of Chief State School Officers

by
Juri Toomepuu

November 13, 1986

Louisville, Kentucky

Department of the Army
"

ABSTRACT

This presentation provides an overview of the magnitude and complexity of the military recruiting task and the all-volunteer concept. The case for high quality military manpower is presented, based on overwhelming evidence of a strong relationship between manpower quality and cost- and combat-effectiveness. High quality manpower is particularly important because of the increasing complexity of weapons systems needed to meet future military threat. Although the quality of Army recruits has improved, the quality of the total enlisted force is still inadequate. Sufficient financial resources are needed to meet manpower quality requirements; educational incentives are ideal for attracting high quality college-bound youth and at the same time contributing to the growth of the nation's human capital. Development of integrated education, manpower, and defense policies is advocated.

DISCLAIMER

Although the author works as a Department of the Army civilian, assigned to the U.S. Army Recruiting Command as the Chief of Research and Studies Division, the findings and conclusions presented in this report are not to be construed as official Department of the Army positions, unless so designated by other authorized documents.

TABLE OF CONTENTS

| | <u>Page</u> |
|--|-------------|
| COVER PAGE..... | i |
| ABSTRACT AND DISCLAIMER..... | ii |
| TABLE OF CONTENTS..... | iii |
| LIST OF FIGURES..... | iv |
| LIST OF TABLES..... | v |
| THE MILITARY RECRUITING TASK..... | 1 |
| The Magnitude of the Task..... | 1 |
| The Complexity of the Task..... | 2 |
| THE ALL-VOLUNTEER CONCEPT..... | 2 |
| Historical Background..... | 2 |
| The Current All-Recruited Force..... | 3 |
| THE NEED FOR QUALITY SOLDIERS..... | 5 |
| Definition of Quality Manpower..... | 5 |
| The Threat..... | 6 |
| Relationships Between Measures of Quality and Performance..... | 8 |
| Lessons from Battle..... | 8 |
| Peacetime Studies..... | 12 |
| The Growth in Complexity..... | 15 |
| THE QUALITY OF THE ARMY'S ENLISTED FORCE TODAY..... | 16 |
| THE ANALYTICAL BASIS FOR RECRUITING..... | 17 |
| Factors that Affect Recruiting..... | 17 |
| The Dual Recruiting Market Concept..... | 20 |
| THE INCENTIVES FOR ATTRACTING QUALITY..... | 21 |
| The Common Goals of Educators and Defense Officials..... | 24 |
| The Challenge Ahead..... | 25 |
| REFERENCES..... | 26 |

LIST OF FIGURES

| | <u>Page</u> |
|--|-------------|
| 1. Department of Defense personnel recruitment in FY 1986..... | 1 |
| 2. Percentage of Army's nonprior service enlisted accessions scoring in the upper half on the AFQT..... | 4 |
| 3. Percentage of Army's nonprior service accessions who are high school graduates..... | 5 |
| 4. Comparison of NATO versus Warsaw Pact military strength..... | 7 |
| 5. Relationships between AGCT score and results of paratroop training. | 9 |
| 6. Obtained relationship between educational level and average percent of fact-quiz items learned..... | 10 |
| 7. Quality versus indiscipline, FY 1980 - FY 1985..... | 14 |
| 8. National unemployment rate and Army enlistment contracts for male high school seniors and graduates scoring in the upper half on the AFQT..... | 18 |
| 9. The declining recruiting market..... | 18 |
| 10. Trends in positive propensity to enlist..... | 19 |
| 11. The dual market recruiting concept..... | 20 |
| 12. The most important reasons for enlisting for male recruits who are high school graduates and score in the upper half on AFQT..... | 22 |
| 13. Initial enlistment contracts for recruits scoring in the upper half on the AFQT, one year before and one year after the initiation of the new GI Bill..... | 23 |
| 14. Comparison of the increase in TSC I-III A enlistment contracts and participation in the new GI Bill by recruits in each branch of military service..... | 23 |

LIST OF TABLES

| | <u>Page</u> |
|---|-------------|
| 1. Armed Forces Qualification Test categories..... | 6 |
| 2. Military performance rating by years of school completed, in percent..... | 10 |
| 3. Mean test and evaluation scores of 283 Israeli Medal of Honor winners in the Yom Kippur War..... | 12 |
| 4. Performance of nonhigh school graduates (NHSG) versus high school graduates (HSG), and TSC IV versus other TSC soldiers..... | 13 |
| 5. Performance-based soldier quality index (SQI)..... | 14 |
| 6. Mean AFQT score of enlisted members, by service..... | 16 |
| 7. Mean AFQT score of enlisted members, FY 1985, by rank and service.. | 17 |
| 8. Marginal costs of high quality recruits for selected resources..... | 21 |

THE MILITARY RECRUITING TASK

The Magnitude of the Task

In 1986 more than 700,000 people were hired by the United States military services. They came to work as sailors, airmen, and soldiers, which, incidentally, include electronics technicians, medical corpsmen, and hundreds of other specialists. And they also came to work as fiber optics engineers, medical doctors, and operations research analysts, like myself (figure 1).

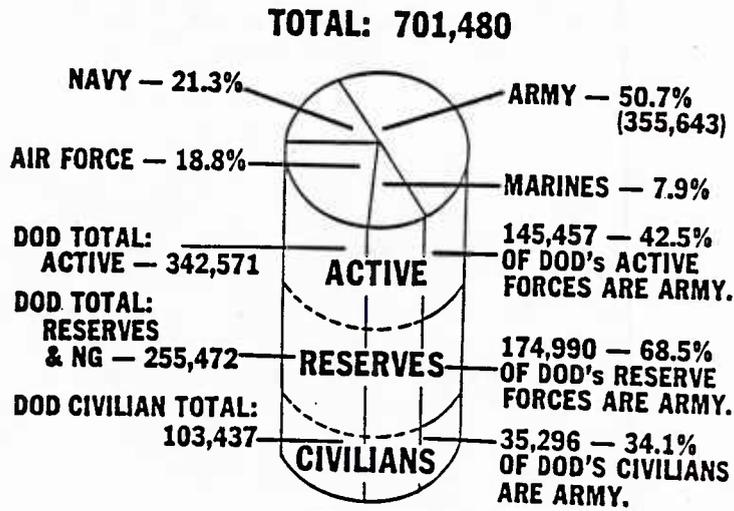


Figure 1. Department of Defense personnel recruitment in FY 1986

People with nearly all the skills that are needed in the civilian economy are also employed by the Department of Defense. In addition, the services recruit people with skills, or willing to learn skills, that are unique to the military.

The one common qualification that all of these people had to have was some level of education. For this reason, I believe it is fair to say that the Department of Defense is the largest single employer of people whose education is the responsibility of the distinguished group gathered here tonight - the chief state school officers of these United States.

In addition to relying on the product of your labors, the military services are also your close associates. Although the services do not provide education in the traditional sense, the Department of Defense deserves to be recognized as one of the largest technical and vocational training organizations in the world.

The bulk of the people coming to work for the military are recent high school graduates with little or no work experience. Many of them are attracted to the military by the skill training offered by the services. The Army Recruiting Command, where I serve, by itself recruits each year around 200,000 Regular Army and Army Reserve volunteers for more than 300 military occupational specialties.

I presume that the status of the military services as the largest single client employing the products of your endeavors and as your associate in the area of vocational and technical training is the reason you invited me to talk to you about education and military manpower requirements. I have already described the magnitude of these requirements; now I will also attempt to describe the complexity of the military recruiting task and the analytical basis for Army recruiting, before presenting to you the case for high quality soldiers, the incentives needed to attract the quality that we require, and the common goals of educators and the military services.

I will restrict my discussion to the recruitment of enlisted people and will focus on the Army, because this is where the greatest challenge lies and because the issue of Army recruitment is complicated enough just in itself even for this expert audience experienced in handling complex issues.

The Complexity of the Task

The complexity of the military recruiting task stems from the requirement to keep a recruiting force, which is based throughout the United States and also in some overseas locations, productive throughout the year in a highly seasonal recruiting market that consists mostly of high school students, who attend school on a seasonal basis. Moreover, the field recruiters, which just for the Army number about 6,500, must assure that each person they persuade to sign up is physically, morally, educationally, and by aptitude score, qualified; is willing to enlist for one of the more than 300 military occupational specialties; and is also willing to start duty on a schedule that allows for an even flow of trainees and efficient operation of the training base.

Most of us are familiar with the complex, computerized, real-time airline reservation systems. The Army's system for matching people to jobs is somewhat similar, but the most sophisticated airline system pales in comparison to the complexity of the Army's, called the REQUEST system. With few exceptions, the airlines do not need to worry about the gender, physical and moral fitness, or aptitude scores of their passengers, and they can adjust their flight schedules and routes in accordance with the market. The Army's REQUEST system, on the other hand, must use numerous decision criteria and accommodate to the persuasive powers of its recruiters and guidance counselors to match prospective recruits who have specific qualifications and desires, and who contract to go on active duty sometime during the next 12 months, to one of the 7,500 annual training classes each with a specific starting date, and for subsequent assignment to a specific job, in a specific location, for a specific number of years.

THE ALL-VOLUNTEER CONCEPT

Historical Background

In the year 1788, John Jay, writing in The Federalist, stated: "Among the many objectives to which a wise and free people find it necessary to direct their attention, that of providing for their safety seems to be the first." Despite such commonly accepted sentiments and the provisions of the American

Constitution "to provide for the common defense," Americans have traditionally been against large standing armies and slow to make needed defense preparations to meet impending national security threats. In the late 1700s the Regular Army had a strength of less than a thousand, and prior to the Civil War it barely exceeded 16,000. The largest strength that the all-volunteer Army ever attained before World War II was 190,000.

Since the Revolutionary War, the Army's regiments had been expected to keep their own ranks full. They had done so by accepting almost anyone who could, as stated in a recruiting poster, "bring his own musket and uniform, who did not have sore legs, scurvy, scale head, ruptures or other infirmities, and was able to carry his weapon." Recruiting was streamlined by Major General Jacob Jennings Brown, Commanding General of the United States Army in the 1820s, the current equivalent of the Army Chief of Staff. By creating the General Recruiting Service in 1822, General Brown eliminated the uncertainty of regimental recruiting and provided the blueprint for a centralized recruiting effort. To resolve the problem of obtaining recruits in the sparsely populated western territories, General Brown ordered three recruiting "rendezvous" stations opened in the eastern United States to enlist soldiers for frontier posts. Within 6 months, more than 640 men had been obtained - twice the number enlisted by regimental recruiting during the previous year.

The Current All-Recruited Force

Today, the United States is one of the few modern nations that maintains a military force on an all-volunteer basis. Of our 15 NATO allies, Iceland has no armed services and Luxembourg maintains a token 625-member force. Of the other allies, only Great Britain and Canada rely on volunteers to maintain their forces. All of our potential adversaries man their forces by conscription. The Soviet Union, to maintain an active force of around 3.6 million, requires all of its 18-year-old male citizens to report to their draft boards. Some exceptions are granted for health or family hardship reasons, or to allow pursuit of university degrees in short supply; but the vast majority of youths enter the Army as privates, at around \$6 per month, and serve 2 years on active duty.

The current all-volunteer concept is based on findings of the President's Commission on the All-Volunteer Force (1970), better known as the Gates Commission, after its Chairman, Thomas S. Gates, Jr., the former Secretary of Defense. The Commission found the concept feasible and cost-effective. It recommended large pay increases for junior enlisted members as the basic incentive for serving, and estimated that a force strength of 2.5 million was achievable, without degradation of force quality, with a net cost increase of \$2.12 billion per year. The all-recruited force, as recruiters like to call it, became a reality at the start of FY 1974. The findings of the Gates Commission were based on analyses conducted mostly by economists who worked on the implied assumption that 18-year-olds act in accordance with perfectly rational and purely economic self-interests.

For such reasons, the track record of economists for predicting the future is not very good, but it is not necessarily worse than the track records of predictors in other disciplines. For example, Charles Duell, the Commissioner of

the U.S. Office of Patents in the 1890s, urged President McKinley to abolish the Patent Office because he was convinced that everything that could be invented had been invented. Because the force level is now down to about 2 million and the costs far exceed the Gates Commission estimates, it is obvious that the Commission was somewhat off the mark.

At the turn of the decade, the Army's recruit quality, as measured by aptitude scores, reached its lowest point since the measurement began, and the quality of the Army's total enlisted force reached the bottom in FY 1981. This setback can be traced to several factors. First, at the end of FY 1976 the GI Bill expired, then the economy recovered from the recession, providing more civilian job opportunities. At the same time, the military/civilian pay ratio declined and recruiting resources were sharply curtailed. The recruiting budget reached an all-time all-volunteer era low in 1977. In fiscal years 1979 and 1980, about half of the Army recruits scored in category IV on the Armed Forces Qualification Test (AFQT), the lowest category eligible by law for military service.

As odd as it may seem, the responsible top-level defense officials at that time declared the all-volunteer force a success and questioned the relevance of quality measures, such as aptitude tests and educational achievement. After some prompting by the Congress, the establishment by law of minimum quality standards, in terms of maximum percentage of nonhigh school graduate recruits and recruits who score in category IV, and assisted by the departure of some of those military manpower officials, the benefits of high quality military manpower became generally recognized. As shown in figures 2 and 3, there has been a steady and dramatic improvement in the quality of recruits since that time.

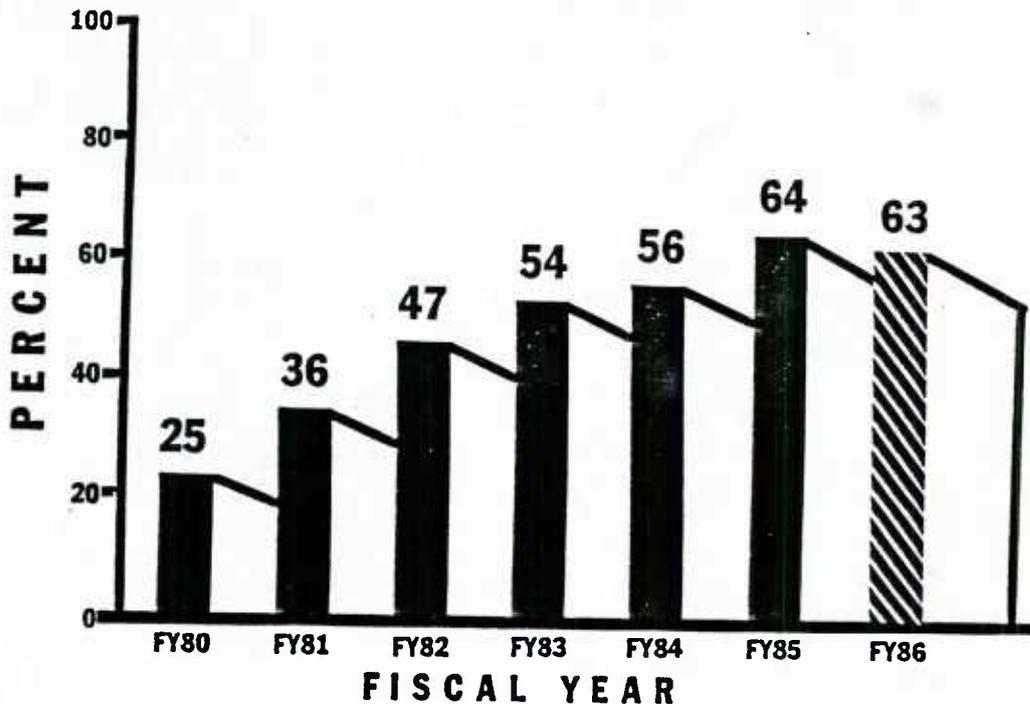


Figure 2. Percentage of Army's nonprior service enlisted accessions scoring in the upper half on the AFQT

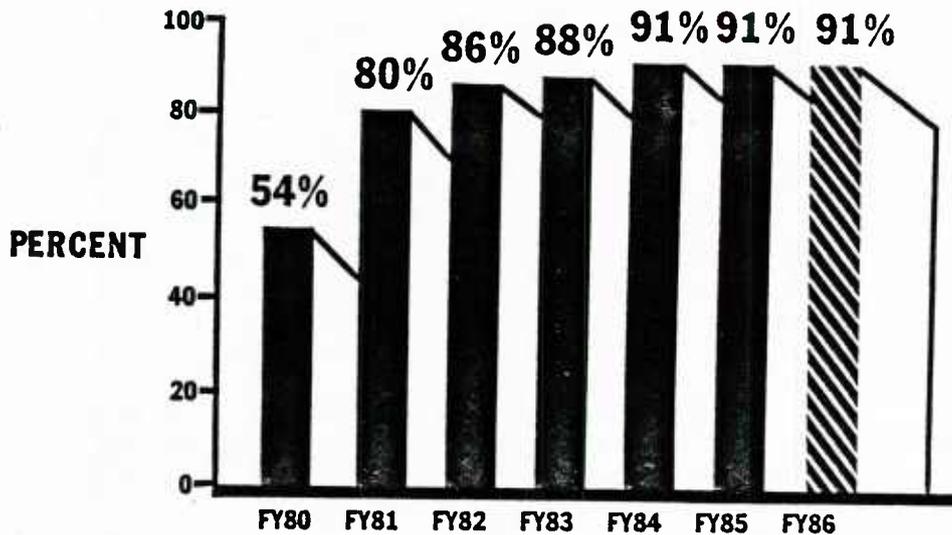


Figure 3. Percentage of Army's nonprior service accessions who are high school graduates

The fact that the United States is the only nation that has recruited the largest military force ever raised without compulsion represents a great accomplishment in itself. However, both the proponents and opponents of the all-volunteer concept generally agree that the viability of our military force depends on quality rather than quantity, particularly the quality of the Army, the largest of the services and the one traditionally associated with the unpleasant aspects of foot-soldiering. *yet we don't reduce the size*

Judging by the great improvements made by the Army in recent years in the quality of its recruits, there is reason to believe that our nation can sustain an all-recruited peacetime Army capable of taking the brunt of an initial enemy attack and providing the noncommissioned-officer leadership and hard-to-learn skills for any mobilization Army that may be needed.

THE NEED FOR QUALITY SOLDIERS

Definition of Quality Manpower

The Department of Defense uses two measures of manpower quality: (1) the scores on the Armed Services Vocational Aptitude Battery (ASVAB) as well as the aptitude area (AA) and Armed Forces Qualification Test (AFQT) scores derived from the ASVAB scores, and (2) the high school diploma. The AFQT is scored on a percentile scale, divided for convenience into five test score categories (TSC) (table 1). Those scoring in TSC V, which represents the lowest scoring 10 percent of the youth population, are by law not eligible for military service; even few TSC IV recruits are accepted these days.

Table 1. Armed Forces Qualification Test categories

| <u>TSC</u> | <u>Percentile Range</u> |
|------------|-------------------------|
| I | 93-99 |
| II | 65-92 |
| IIIA | 50-64 |
| IIIB | 31-49 |
| IV | 10-30 |
| V | 1-9 |

The Threat

It is relatively easy to find general agreement that high quality soldiers, like high quality schools and teachers, are needed. Questions quickly arise, however, about the costs associated with specific levels of quality.

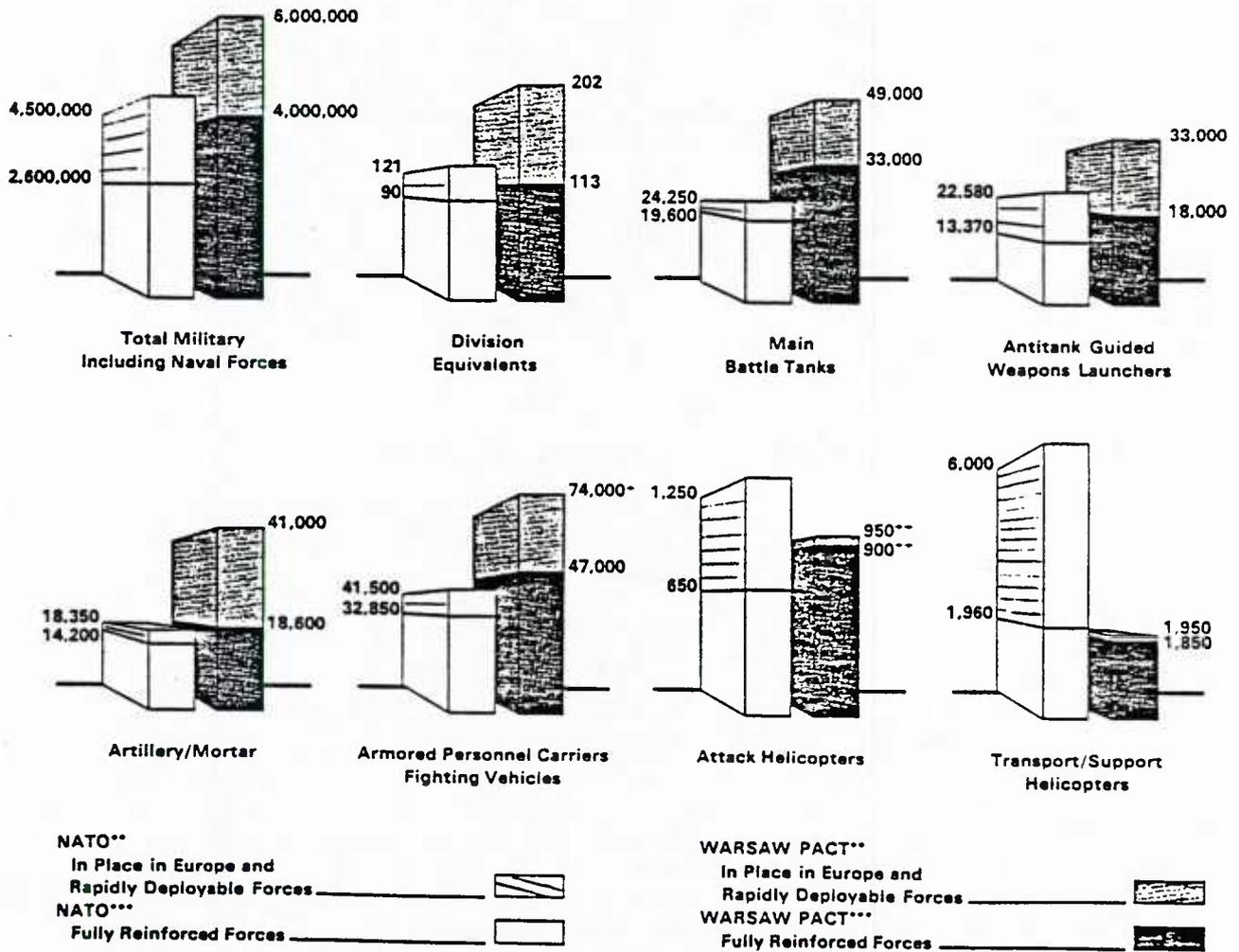
The hard questions the military manpower chiefs must answer, and our congressional representatives resolve, are: "How much quality is enough?" and "What is the most cost-effective mix of resourcing for various competing programs?"

To answer these questions, we must start by looking at the military threat to our national security.

Unfortunately, mankind has not yet reached a stage in its evolution where we can resolve our conflicting personal and even less our national ideological and economic interests without killing each other. As much as we may believe that we should strive toward that stage, and as much as we may sympathize with the advocates of disarmament, given the fact that our major adversaries are even lower on the evolutionary scale toward peaceful coexistence than we are, a unilateral disarmament by the U.S. would probably result in a major setback for all mankind. While there are important differences in opinions about the desirability for specific defense programs, the amount of the total outlay for defense, and how far we can trust the Soviets, the leaders of both of our major political parties and the vast majority of the American people seem to agree that we must maintain a defense that is adequate to meet any threat.

As Damon Runyon once remarked, "the race is not always to the swift, nor the battle to the strong, but that's the way to bet." In total military strength, we do not compare well with the Soviets, whose goals continue to be effective application of military power to achieve Soviet political aspirations and the imposition of its political system wherever and whenever possible. There is also ample evidence that the Soviets are continuing their all-out effort to increase their military power.

As evidenced by figure 4, it is obvious that we are unable to match our major adversaries man for man, gun for gun. Our current deterrence against a surprise all-out attack is our formidable strategic retaliation capability and, in the future, possibly the results of the strategic defense initiative. Our



Excludes France and Spain

Warsaw Pact divisions normally consist of fewer personnel than many NATO divisions but contain more tanks and artillery, thereby obtaining similar combat power.

* US estimate of 1985 data.

** Rapidly deployable forces—Include those US forces whose equipment is stored in Europe and high-readiness Soviet forces located in the Baltic, Belorussian, Carpathian, Odessa, Kiev, and North Caucasus Military Districts.

*** Fully reinforced forces—Include North American reinforcements and all Warsaw Pact forces located west of the Ural Mountains.

* Excludes armored command vehicles and other carriers.

** Excludes transport helicopters that can be configured for attack roles.

Figure 4. Comparison of NATO versus Warsaw Pact military strength
 SOURCE: U.S. Department of Defense, Soviet Military Power, 1986.

hope for a long-term, relatively safe military balance for conventional wars is the edge that our technology gives us. That leaves, of course, plenty of room for possible damage to the free world and to our national interests by low-intensity, unconventional conflicts carried out by proxies of the Soviets in non-European areas. Such low-level conflicts are considered the most probable for the future, as determined by a major study on the Army's future strategic requirements by the Georgetown University Center for Strategic and International Studies (Kupperman and Taylor, 1984).

Improvements in our strategic retaliation or defense capabilities clearly require the innovative efforts of the best products of our education system, our top scientists and engineers. The operation and maintenance of our sophisticated weapons and defense systems clearly require top-notch military people. But what levels of ability are needed by the soldiers who man and maintain our conventional weapons, fight in unconventional, low-intensity wars, or counter terrorism?

Relationships Between Measures of Quality and Performance

Lessons from Battle. Our need for high quality soldiers and the basis for the quality measures used by the Department of Defense are best explained by looking at what actually happens in battle.

A war started on the chilly morning of the last day of November 1939, when the giant Red Army of the Soviet Union, with forces totaling nearly a million men, launched an air, land, and sea attack against Finland, its northwestern neighbor, whose entire population at the time numbered only about 3½ million people. By any measure of military power and effectiveness used in defense analysis and force planning, the Finnish forces should have been decisively defeated in a matter of days. However, something quite different actually happened. The Finns, by relentlessly attacking and harassing the invaders and by using the harsh climate and the snow-filled terrain to their advantage, managed to keep the Soviets off balance, demoralized, and ineffective, and to out-think and out-fight their enemy at every level of command.

Even though Finland was finally forced to accede to Soviet territorial demands, Stalin, in the face of the punishment meted out to his Army, lost his stomach for the even greater losses the Red Army would have suffered if the Soviets had tried to rob the Finns of their sovereignty and democratic way of life.

The United States Army's Brigadier General S.L.A. Marshall (1947), while gathering historical data from front line infantry units during World War II, made the startling discovery that only about 15 percent of the soldiers in battle actually fired their weapons, and that the fighters were observably different from other soldiers. In the bitterly fought battle for Omaha Beach, he found that on a two-division front, only six rifle companies could be considered effective as units, and only 47 men, at widely scattered intervals along the beach, saved the day from disaster. Marshall concluded that the outcomes of battles are decided by a relatively few effective participants.

Large amounts of psycho- and sociometric data on the effectiveness of soldiers are available from World War II. Most of these were collected and analyzed by the Research Branch of the War Department's Information and Education Division, and later published in numerous volumes (Stouffer *et al.*, 1949, Vols. I, II, IV; Hovland *et al.*, 1949; Ginzberg *et al.*, 1959, 3 vols; U.S. Department of the Army, 1965).

Typical data from World War II research are shown in figures 5 and 6 and in table 2. It should be noted that a high positive correlation existed during World War II between educational attainment, mental aptitude as measured by the Army General Classification Test (AGCT), and literacy. This justified the use of measures of educational attainment as surrogates for aptitude measures in many studies where the latter were not readily available. The phenomenon of lowering or eliminating academic standards for school promotion and graduation that became popular in the 1960s has considerably lowered the correlations between educational attainment, mental aptitude, and literacy of the youth who entered the military service since that time.

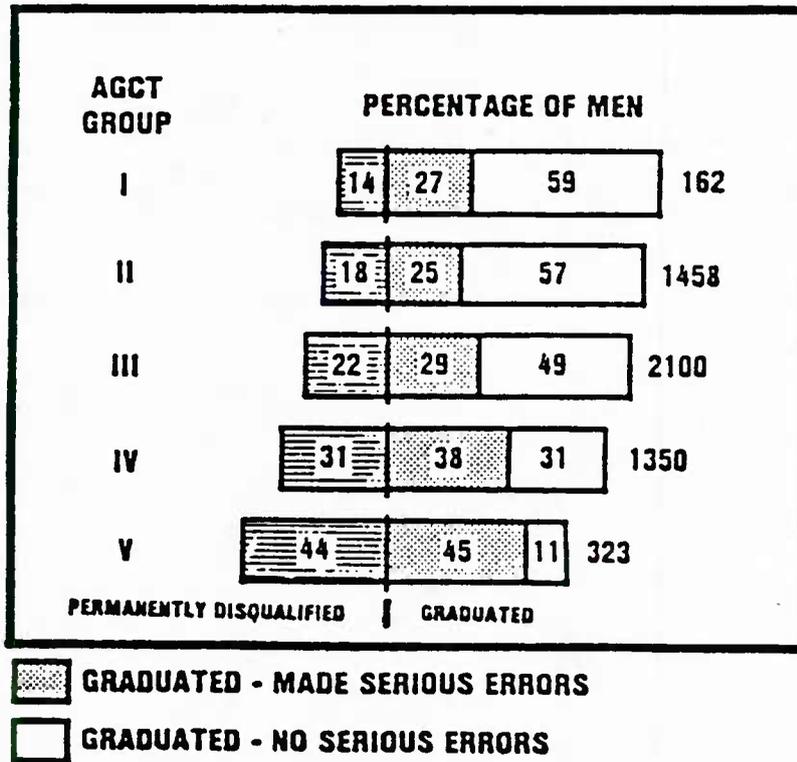


Figure 5. Relationships between AGCT score and results of paratroop training

SOURCE: Stouffer *et al.*, The American Soldier: Combat and Its Aftermath, 1949.

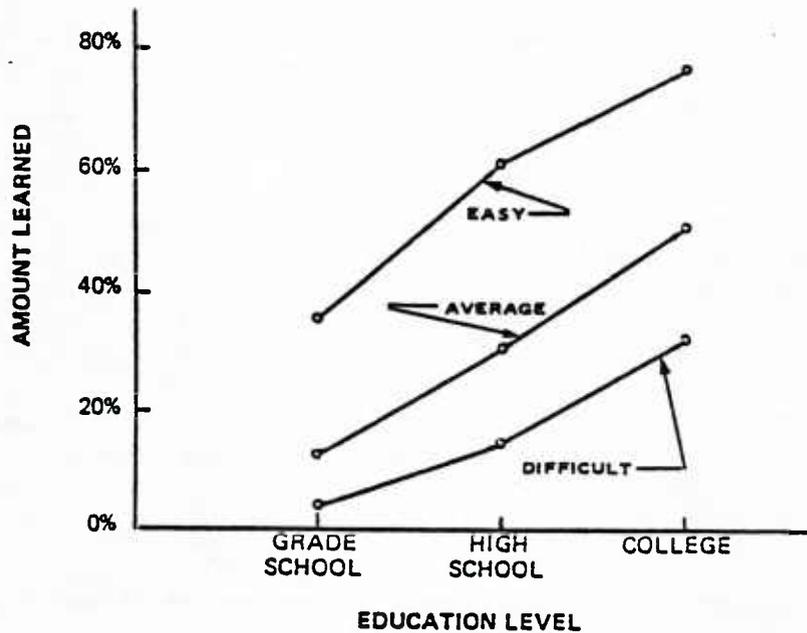


Figure 6. Obtained relationship between educational level and average percent of fact-quiz items learned
 SOURCE: Hovland et al., Experiments in Mass Communication, Vol. III of Studies in Social Psychology in World War II, 1949.

Table 2. Military performance rating by years of school completed, in percent

| <u>Year of School Completed</u> | <u>Total</u> | <u>Military Performance Rating</u> | | | |
|---------------------------------|--------------|------------------------------------|-------------------|-------------|------------------|
| | | <u>Good</u> | <u>Acceptable</u> | <u>Poor</u> | <u>Not Rated</u> |
| 0-3 | 100.0 | 1.4 | 38.2 | 50.9 | 9.5 |
| 4-7 | 100.0 | 2.4 | 58.2 | 31.8 | 7.6 |
| 8 | 100.0 | 17.1 | 62.9 | 18.7 | 1.3 |
| Some high school | 100.0 | 14.3 | 59.8 | 21.6 | 4.3 |
| High school graduation | 100.0 | 11.9 | 65.3 | 4.2 | 18.6 |
| Some college | 100.0 | 23.1 | 49.8 | 7.7 | 19.4 |
| Total cohort | 100.0 | 8.7 | 56.2 | 26.5 | 8.6 |

SOURCE: Ginzberg et al., Patterns of Performance, Vol. III of The Ineffective Soldier: Lessons for Management and the Nation, 1959.

Useful soldier effectiveness data were also collected and analyzed during the Korean and Vietnam Wars. In Korea, the Human Resources Research Organization (HumRRO) undertook studies to identify the characteristics that differentiate the "fighter" from the "nonfighter" in combat (Egbert, et al., 1957, 1958). HumRRO found 11 characteristics that distinguished fighters from nonfighters; the first on the list was intelligence. The fighter was found to: (1) be more intelligent, (2) be more masculine, (3) be a "doer," (4) be more socially mature, (5) be preferred socially and in combat by his peers, (6) have greater emotional stability, (7) have more leadership potential, (8) have better health and vitality, (9) have a more stable home life, (10) have a greater fund of military knowledge, and (11) have greater speed and accuracy in manual and physical performance.

The HumRRO study found that men who are low in intelligence tend to make poor fighters, and concluded that when any combat branch is allocated a disproportionate share of men from the national manpower pool who are low in ability, its fighting potential will be reduced.

The data from the Israeli-Arab wars provide the latest, quite valuable information about the impact of soldier capabilities on the effectiveness of weapons, units, and forces. A number of studies were done by American researchers (US Department of the Army, 1974a, b; Pascal et al., 1979; Dupuy et al., 1976).

All of these studies conclude that a soldier's mental ability plays an important role in combat-effectiveness. Characteristics of the best Israeli soldiers, the winners of the Israeli Medal of Honor, were studied by Gal (1982). The results are summarized in table 3.

Table 3. Mean test and evaluation scores of 283 Israeli Medal of Honor winners in the Yom Kippur War

| Test/Evaluation | Percentile (of Mil. Pop.) |
|--|------------------------------|
| Primary Psychotechnical Ratio ^a | 86 |
| General Quality Score ^b | 93 |
| Motivation-to-Service Index ^c | 95 |

- a. Intelligence test based on Raven's progressive matrices and an Otis-type verbal test.
- b. Consists of IQ, education, literacy, and motivation index.
- c. Based on semi-structured interview before enlistment reflecting motivation to serve in the Army and combat units.

SOURCE OF DATA: Gal, Reuven, "Characteristics of Heroism," in S. Breznitz (ed.), Stress in Israel, 1982. Prepared by J. Toomepuu.

The medal-winners represent a very high cross-section of the Israeli soldier population in terms of their general quality. Their mean General Quality Score (GQS), an Israeli Armed Forces selection index consisting of the intelligence quotient and measures of the level of education, linguistic ability, and motivation, fell in the 93rd percentile of the military population. The mean score of the intelligence quotient alone was in the 86th percentile.

Peacetime Studies. In addition to the lessons learned from combat, numerous peacetime studies have been conducted to determine the relationships between soldier characteristics and performance.

Particularly relevant are the evaluation studies of Project 100,000, a massive social experiment that resulted in the acceptance of over 300,000 low aptitude personnel into military service between October 1966 and December 1971. Two-thirds of the total were assigned to the Army, and one-third of these were placed into low-skill combat jobs. The next most common assignments were in low-technology food service, supply, wire communication, motor transportation, construction, and police jobs.

A large number of studies were made of these soldiers and their Navy, Air Force, and Marine Corps counterparts (Ratliff et al., 1976). The Human Resources Research Organization (McFann, 1969), as a result of their extensive research, found the following:

- a. Job performance is directly related to both AFQT score and job experience.
- b. Differences in performance for different AFQT groups increase with difficulty of tasks.
- c. Supervisor ratings are highly skewed toward the favorable end and only moderately related to job-knowledge criteria.
- d. Reading and listening abilities and arithmetic skills were all found to be related to job proficiency. Reading ability was more highly related to some job tasks than the AFQT score.

HumRRO concluded that a sizable portion of the lower aptitude soldiers would perform at acceptable levels in the jobs that they studied. But to interpret their findings properly, we should keep in mind that the Army assigned Project 100,000 soldiers only to jobs with minimal skill requirements, and HumRRO only studied four low-skill jobs.

As an example of the relationships between AFQT scores and skill requirements, HumRRO found an insignificant difference in the abilities of cooks in TSC IV versus cooks in TSC I-III in accomplishing the simple task of scrambling eggs. For the more complicated task of making a jellyroll, the result is a significant 59.9 percent for cooks in TSC IV versus 70.3 percent for cooks in TSC I-III.

The most important HumRRO finding is that of the 849 subtests for the four simple jobs in the study, all, except the making of scrambled eggs, showed a significant difference in performance on the basis of AFQT categories (Vineberg and Taylor, 1970).

Similar results have been found by more recent studies. The results of the Army Quality Soldier Study (US Department of the Army, 1975) are summarized in table 4.

Table 4. Performance of nonhigh school graduates (NHSG) versus high school graduates (HSG), and TSC IV versus other TSC soldiers

| |
|--|
| <u>Loss rate in training (Trainee Discharge Program)</u> |
| o NHSG 1.8 times greater than HSG |
| o TSC IV 2.9 times greater than TSC I |
| <u>Academic failures in TRADOC MOS courses</u> |
| o TSC IV 2.8 times greater than TSC I-III, Schools |
| o TSC IV 3.7 times greater than TSC I-III, Centers |
| <u>AWOL rate in units</u> |
| o NHSG 2.6 times greater than HSG |
| o TSC IV 1.4 times greater than TSC I-III |
| <u>MOS test failure rate</u> |
| o NHSG 1.6 times greater than HSG |
| o TSC IV 1.6 times greater than TSC I-III |
| <u>Unsatisfactory rating in key positions</u> |
| o NHSG 3.7 times greater than HSG |
| o TSC IV 3 times greater than TSC I-IIIA |

SOURCE: U.S. Department of the Army, Quality Soldier Study, Fort Monroe, VA: U.S. Army Training and Doctrine Command, Deputy Chief of Staff, Personnel, 1975.

The Army's Soldier Capability-Army Combat Effectiveness (SCACE) study (Toomepuu, 1981) contained an extensive review of relevant literature, resulting in a bibliography of 720 documents pertaining to soldier effectiveness. The study found that:

a. Aptitude tests, high school graduation, and literacy measures are good predictors of performance of soldiers in combat and in peacetime.

b. The relationship between soldier performance and mental aptitude is essentially linear.

c. The need for highly trainable soldiers has increased dramatically since World War II.

The study recommended integration of soldier capability factors into planning, programming, resource allocation, and systems acquisition decisions; into war games and analysis; and making manpower quality improvement the top priority for the Army.

There is some solid evidence that the steady improvement in soldier quality since the difficult recruiting years at the turn of the decade has greatly improved the combat-readiness and cost-effectiveness of the Army. Figure 7 shows the decline in indiscipline cases going hand in hand with the increase in

Decline in Disciplinary Cases

the accession of male high school graduates who score in the upper half of the AFQT (GMA). Although figures for costs of indiscipline are not systematically collected, the cost in unproductive manpower and decrease in combat readiness is enormous. The U.S. General Accounting Office (1979) estimated the cost of military AWOLS alone, for the period from July 1974 through July 1977 to be \$1.1 billion, using a conservative, far from complete cost model.

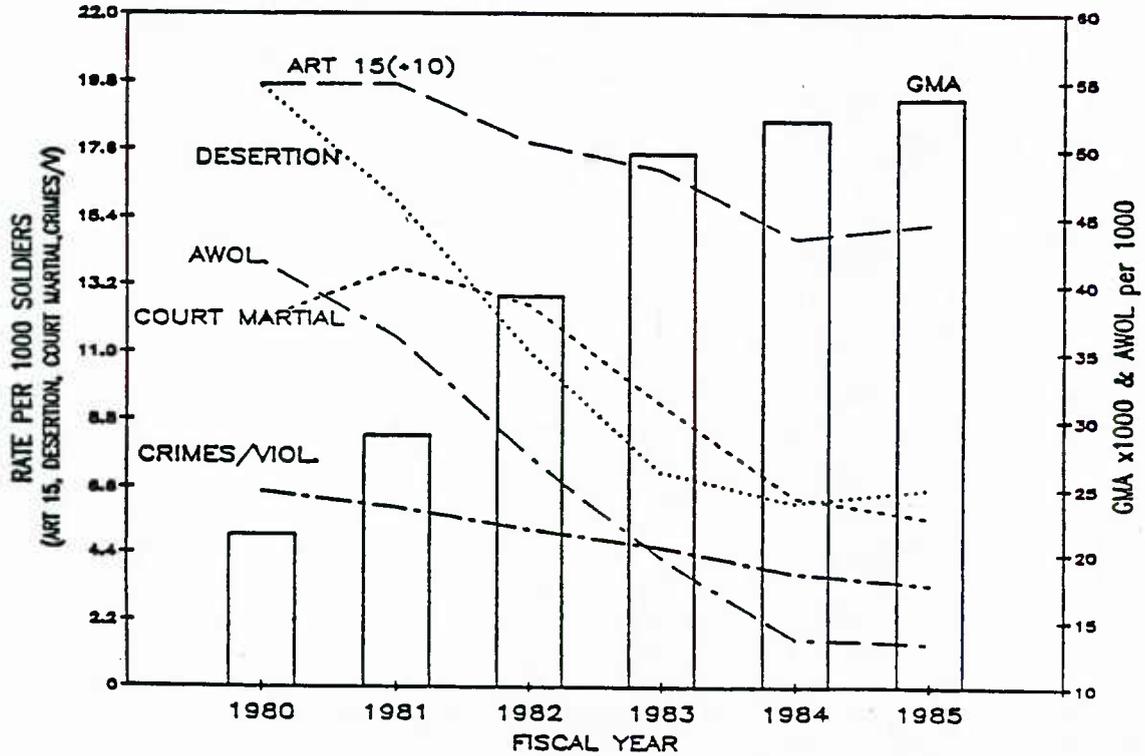


Figure 7. Quality versus indiscipline, FY 1980-FY 1985.
Prepared by Kenneth Martell, HQ USAREC,
September 1986.

The Skill Qualification Tests (SQT) that soldiers are required to take to verify their ability to perform their jobs and to qualify for retention and promotion are useful measures of actual performance. The passage rates on SQTs are strongly related to the AFQT test score category (TSC). Based on this relationship, the Army Recruiting Command (Toomepuu, 1986) has developed the Soldier Quality Index shown in table 5.

Table 5. Performance-based soldier quality index (SQI)

| TSC | Quality Index | |
|------|-------------------|-----------------|
| | HSDG ^a | NG ^b |
| I | 1.00 | 0.83 |
| II | 0.80 | 0.66 |
| IIIA | 0.57 | 0.47 |
| IIIB | 0.38 | 0.32 |
| IV | 0.26 | 0.22 |

a. High school degree graduate
b. Nongraduate

The Growth in Complexity

The evidence of a strong and growing threat to our national security is overwhelming; and a large body of literature provides evidence of a strong, essentially linear relationship between our measures of quality and the peacetime and combat performance of soldiers. However, to determine the appropriate goals for manpower quality, we must also look at the types of weapon systems that must be manned and maintained today and in tomorrow's Army, and at the battles we must be prepared to fight and win.))

The issue of increasing complexity of Army jobs was specifically addressed by a major study conducted by the Army Combined Arms Combat Development Activity (Ostovich et al., 1982). The study found:

- a. A steady upward migration of aptitudinal requirements.
- b. A steady increase in institutional training requirements on new systems.
- c. An increase in skill sustainment training requirements in units.
- d. An increase in the difficulty of training management because of systems' complexity.
- e. An increase in the difficulty, complexity, and cost of the total maintenance task even though some new systems are easier to operate.
- f. Soldier quality plays an important role in combat- and cost-effectiveness.
- g. Improvements are needed: The Army must establish manpower quality goals in terms of mean Armed Forces Qualification Test (AFQT) scores and percentage of test score category (TSC) I and II soldiers, and avoid accepting a substandard level of quality to meet end strengths.

Martin Binkin, the well-known Brookings Institution manpower analyst, in his recent book (1986) on the effects of technological growth on defense manpower requirements, has compiled data from published reports and from Department of Defense sources that show a growth in technical jobs from around 12 percent in 1953 to more than 27 percent in 1985, and in electronics-related jobs from 5 to 19 percent, a growth rate of 280 percent.

The manpower portion of the Army 21 study, undertaken to determine the manpower needs for the foreseeable future, found that increased quality soldier demands predominate (Lining, 1985). The study concluded that the future soldier must be able to make rapid, independent decisions and be better educated, with an expert level of technological understanding. Such a multi-capable soldier, besides being a good fighter, must clearly score high on the quality measures used by the Department of Defense - aptitude tests and educational level.))

Even today, the mechanic for our main battle tank must go to war with seven suitcases full of diagnostic equipment, and he and the operating crew must be able to put to proper use the 22 volumes of manuals needed to operate the tank.

A few years ago a squad of mechanized infantry moved in the field at the top speed of 19 miles per hour. Today the squad can move at better than 30 miles per hour and is armed with, in addition to or in lieu of earlier weapons, a rapid-firing, stabilized 25-mm cannon, TOW anti-tank missiles, a coaxial 7.62-mm machine gun, the squad automatic weapon, vehicle firing port weapons, and thermal sights. While no one would classify their jobs as technical, the fact is that even today's infantrymen must be capable of coping with complex technology, and the increase in complexity seems to be accelerating rather than slowing.

THE QUALITY OF THE ARMY'S ENLISTED FORCE TODAY

To know what, if any, improvements are needed in Army manpower, we also must look at where we are today. We have told you that we have made great strides in recruiting the type of soldier needed to meet the threat. For 1986, 91 percent of our recruits were high school graduates, versus 54 percent in 1980; and about 63 percent scored in the top half of the AFQT, versus only 25 percent in 1980. However, recruiting represents only half of manpower quality. The proper measure is the total enlisted force, counting not only those who enlist but also those who leave, and then taking stock of the force that remains.

Theoretically, we could take in very high quality personnel, but if even higher quality people leave, we could suffer a net loss. This has not happened, but it will take many years and continued improvement to recover from the disastrous years of 1979 and 1980.

As shown in table 6, the mean AFQT score of the Army enlisted force in FY 1985 was, after some of the best recruiting years in the all-volunteer period, still below the FY 1975 mean, and lagging the Air Force by 9.5 points.

Table 6. Mean AFQT score of enlisted members, by service

| FY | Mean AFQT Score by Svc. | | | |
|-------|-------------------------|------|------|------|
| | USA | USN | USAF | USMC |
| 1975 | 53.0 | 61.3 | 61.1 | |
| 1981 | 44.5 | 57.4 | 59.5 | 49.4 |
| 1982 | 46.8 | 58.5 | 59.9 | 50.1 |
| 1983 | 49.4 | 59.1 | 60.5 | 51.5 |
| 1984 | 51.3 | 59.6 | 61.2 | 52.4 |
| 1985* | 51.4 | 59.6 | 60.9 | 52.4 |

* As of 31 Dec; scores of some E1-E3 are renormed to the 1980 reference population.
 SOURCE OF DATA: Defense Manpower Data Center.
 Prepared by J. Toomepuu.

An even more dismal picture emerges if we look at the mean AFQT score of the enlisted populations of the services by grade, as shown in table 7.

Table 7. Mean AFQT score of enlisted members, FY 1985, by rank and service^a

| Rank | Mean AFQT Score | | | |
|------|-----------------|------|------|------|
| | USA | USN | USAF | USMC |
| E-1 | 52.4 | 52.3 | 61.6 | 52.0 |
| E-2 | 55.6 | 54.8 | 63.6 | 54.9 |
| E-3 | 56.6 | 57.2 | 63.2 | 52.7 |
| E-4 | 49.7 | 60.4 | 58.2 | 49.5 |
| E-5 | 45.7 | 61.6 | 60.7 | 52.8 |
| E-6 | 51.4 | 62.0 | 58.6 | 57.3 |
| E-7 | 54.9 | 66.1 | 62.6 | 59.7 |
| E-8 | 53.7 | 67.5 | 64.8 | 61.8 |
| E-9 | 52.9 | 66.3 | 66.5 | b |

a. As of 31 Dec. 1984; scores of some E1-E3 are renormed.

b. Insufficient data.

SOURCE OF DATA: Defense Manpower Data Center.

Prepared by J. Toomepuu.

The aptitude scores of the Army's corporals and buck sergeants are below the total youth population average, and the scores for all ranks of the Army's non-commissioned officers are substantially below their counterparts in the other services.

THE ANALYTICAL BASIS FOR RECRUITING

Factors that Affect Recruiting

A great deal of research has been done to determine the most cost-effective ways of manning the military services. Some 200 years ago, Edmund Burke, the famed British political philosopher and statesman, stated that "the age of chivalry has gone; that of sophisters, economists, and calculators has succeeded."

Even though I firmly believe that the qualities associated with chivalry, such as courage, gallantry, generosity, and courtesy, are alive and well in today's Army, we must recognize that for the all-recruited military, just as for other governmental, public, and commercial institutions, the age of economists and calculators has clearly arrived.

The research efforts to identify the factors that affect recruiting fall primarily into the categories of demographic and market analyses, attitude and intention surveys, analyses of economic factors and econometric modeling, cost-effectiveness analyses, and management improvement studies.

Although in the last few years the links between the national economy and, in particular, unemployment and recruiting have been weakened, as shown in figure 8, the inverse relationship between recruiting success and the overall economic health and affluence of the nation still remains the most perturbing factor in Army recruiting. Policies and programs must be continued that break this pernicious link and assure that the U.S. military services are manned, in good economic times as well as in bad, with highly capable individuals.

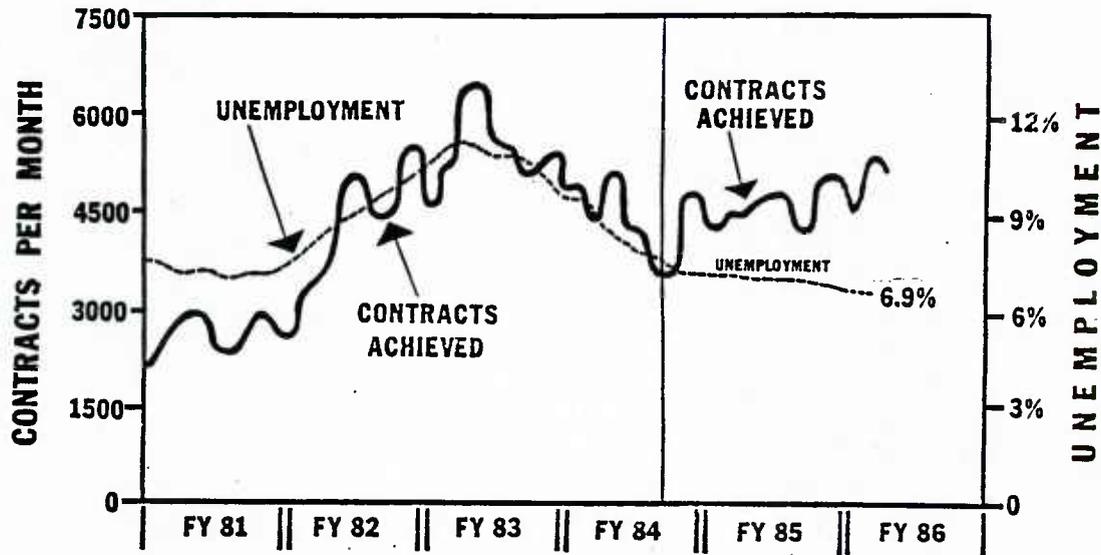


Figure 8. National unemployment rate and Army enlistment contracts for male high school seniors and graduates scoring in the upper half on the AFQT

Some of the other major factors in recruiting success are the size of the youth population, which, as shown in figure 9, will be declining for some time, military pay, enlistment incentives, and various other resources and Army offers.

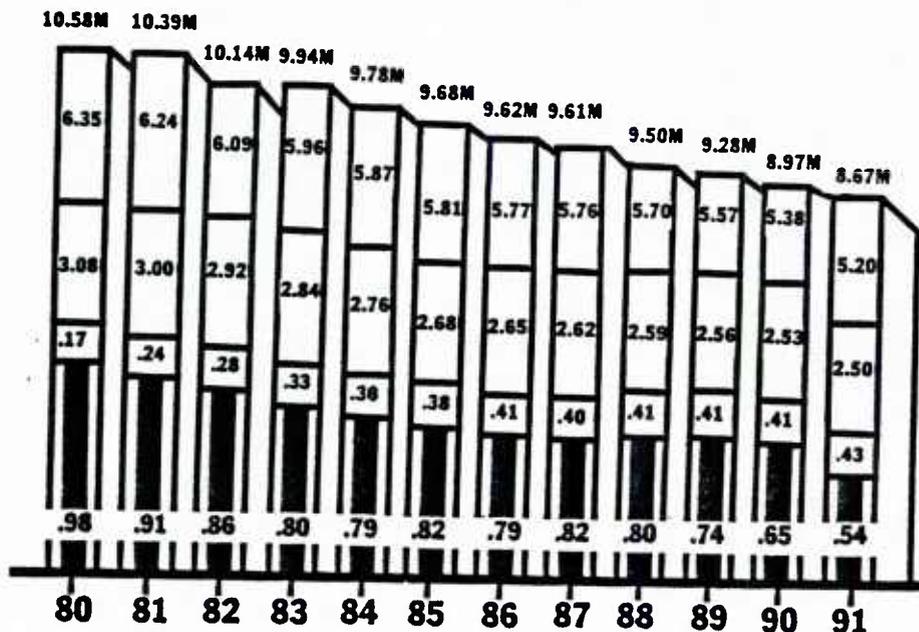


Figure 9. The declining recruiting market*

* Male, 17-21 years old, upper half on AFQT.

SOURCE: U.S. Army Recruiting Command; Census Bureau; Department of Education.

To improve the cost-effectiveness of recruiting and plan for the future, sophisticated computer models employing various econometric and mathematical techniques have been developed. The latest models provide useful information and insights, but they are reliable predictors of the future only in relatively stable conditions. Even though we have come a long way since the year 375, when Emperor Constantine, in an attempt to forever silence the curious who want to foretell the future, promulgated a law prohibiting anyone to consult a soothsayer, mathematician, or forecaster, the latest econometric models alone are still not quite adequate for making predictions.

Surveys are used to obtain information on individual attitudes, opinions, and knowledge of the military as a career option. One of these is the Youth Attitude Tracking Study, conducted since 1975 by the Department of Defense to take the pulse of our recruiting market.

Respondents are asked how likely they are to serve in the military over the next few years on a four-point scale of likelihood: definitely, probably, probably not, and definitely not. Those answering definitely or probably are considered to have a positive propensity for military service. The others, including those who do not answer, are members of the negative propensity group.

Those with a positive propensity tend to be younger, more likely to be looking for work, and more likely to be members of minority groups. Using father's education as an index of socioeconomic status, they come from more modest socioeconomic backgrounds. They also tend to have weaker academic backgrounds and be less scientifically oriented, as indicated by their high school curricula and grades.

The trends in propensity to join the different military services are shown in figure 10.

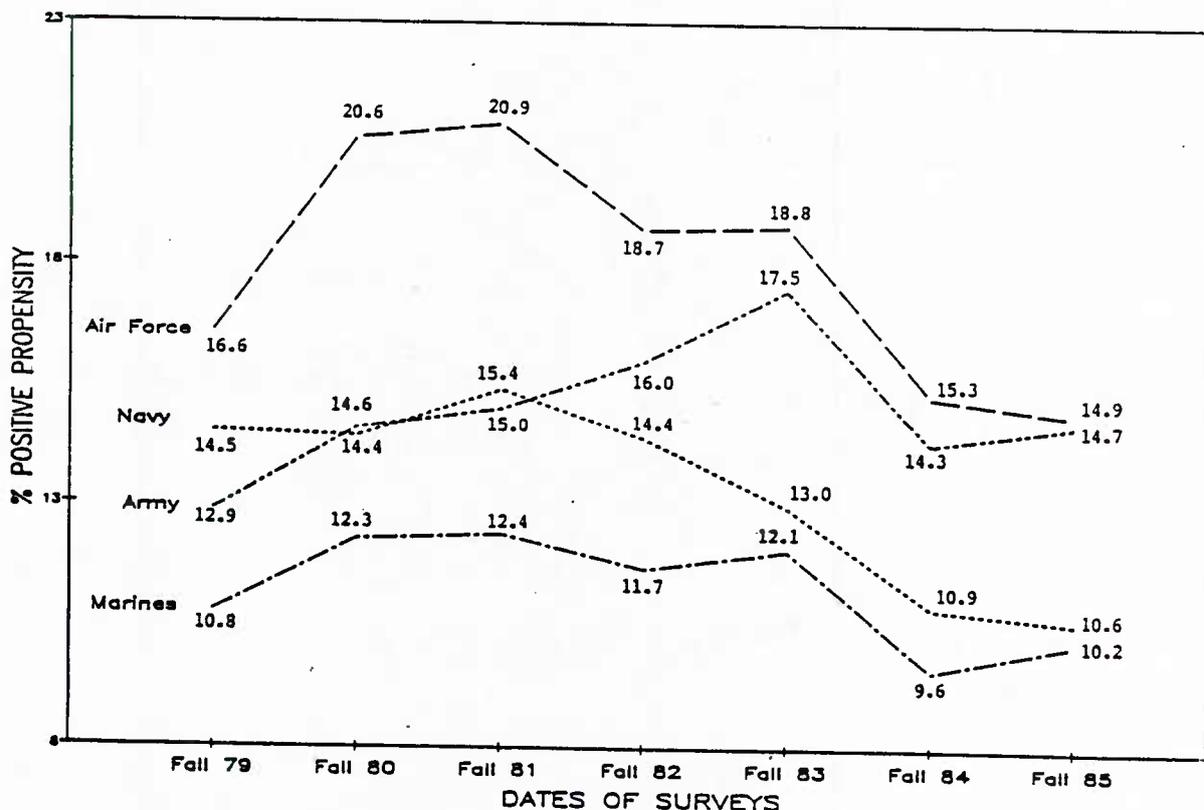


Figure 10. Trends in positive propensity to enlist
SOURCE: Youth Attitude Tracking Study, fall surveys (reweighted).

While the Army is making good progress in relation to its sister services, the propensity to join the Army is unfortunately highest in the least qualified segment of the youth population, and the Army must recruit a much larger share than the other services.

The Dual Recruiting Market Concept

The information gathered by surveys, econometric modeling, and other studies, particularly on the effects of educational enlistment incentives, indicate that there are two distinct groups of recruits.

This dichotomy provides the basis for the Army's dual recruiting market concept: the employment-oriented youth on one side and the college-oriented on the other, as shown in figure 11. Whereas both groups have some common motivations, such as the desire to serve their country, the employment-oriented youth tend to be more interested in job-related benefits. The college-bound youth, on the other hand, are more likely to be motivated by deferred benefits, such as the opportunity to finance their future education through the Army College Fund (ACF). They sign up for the shortest available term and tend to look at military service mostly in terms of a hiatus from school, an adventure, and a growth experience offered by service, and conform, therefore, more to the tradition of American citizen-soldiers.

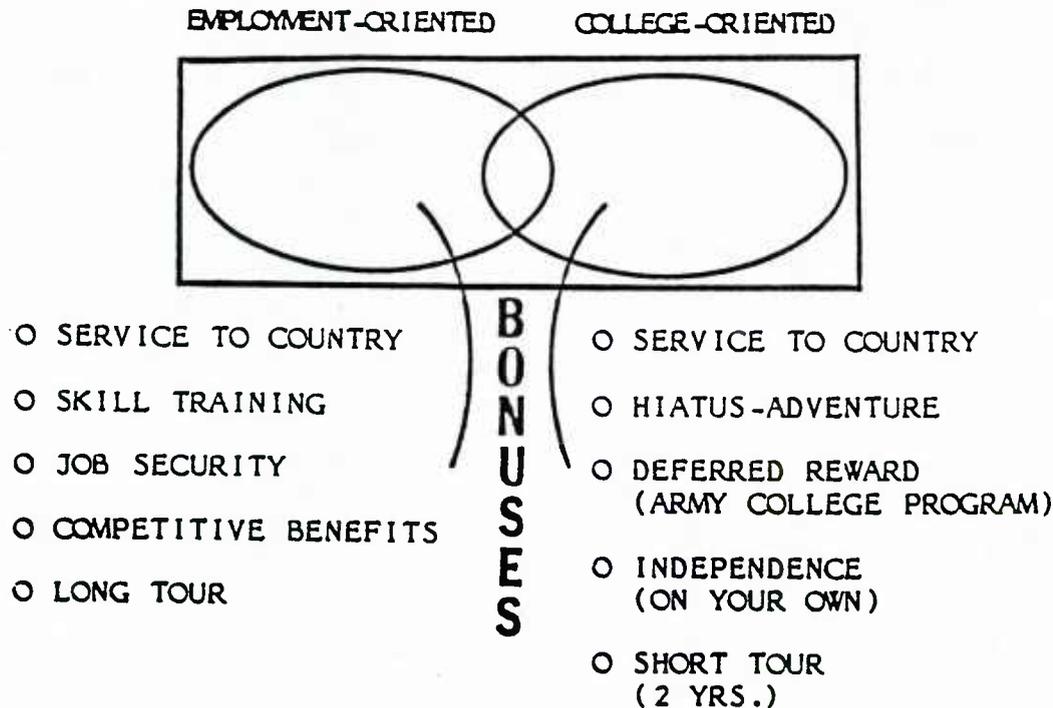


Figure 11. The dual market recruiting concept

Starting with the Revolutionary War, the United States has depended on both the citizen-soldier and the professional to provide for its common defense. The citizen-soldiers have provided the bulk of the forces during the wars while professionals have provided the cadre and the bulk of defense forces in peacetime.

Morris Janowitz, the military sociologist who founded the Inter-University Seminar on Armed Forces and Society, in his latest book, The Reconstruction of Patriotism (1983), characterizes the notion of the citizen-soldier in three significant dimensions: obligatory service, universality, and essential legitimacy as judged by democratic standards. Whereas the current 2-year volunteers do not meet these criteria for citizen-soldiers, they represent what Charles Moskos, the prominent military sociologist at Northwestern University and an astute analyst of the all-volunteer Army (1985), calls the functional equivalent of the citizen-soldier in the all-volunteer Army.

THE INCENTIVES FOR ATTRACTING QUALITY

George Washington, whose tightfisted fellow founding fathers were somewhat grudging in providing urgently needed funds for the Continental Army, said that patriotism "...must be aided by a prospective interest of some reward. For a time, it may itself push men into action, to bear much, to encounter difficulties. But it will not endure unassisted by interest." Educational enlistment incentives are ideal for providing the interest advocated by George Washington.

The college-bound segment of the youth population is the largest untapped source of the top-quality people we need, and our analysis shows (table 8) that educational incentives, such as the GI Bill and the ACF, are the most cost-effective means for attracting this group into military service.

Table 8. Marginal costs of high quality recruits for selected resources

| <u>Resource</u> | <u>Marginal Cost*</u> |
|-----------------|-----------------------|
| Pay | \$33,008 |
| Bonuses | 37,194 |
| Recruiters | 7,687 |
| ACF | 7,063 |
| Advertising | 10,435 |

* Based on increase in resource equal to cost of 1 percent increase of USAREC budget.

Numerous surveys and studies have consistently found education incentives to be an effective enlistment incentive that appeals to the segment of the youth population that possesses greater abilities and leadership potential

(U.S. Department of the Army, 1975; Goral and Lipowitz, 1974; Institute of Social Research, 1976; Toomepuu, 1985, 1986a, b). The results of recent Army surveys of new recruits show that money for college is the most important reason for enlisting for those who are high school graduates and score in the upper half on the AFQT (figure 12).

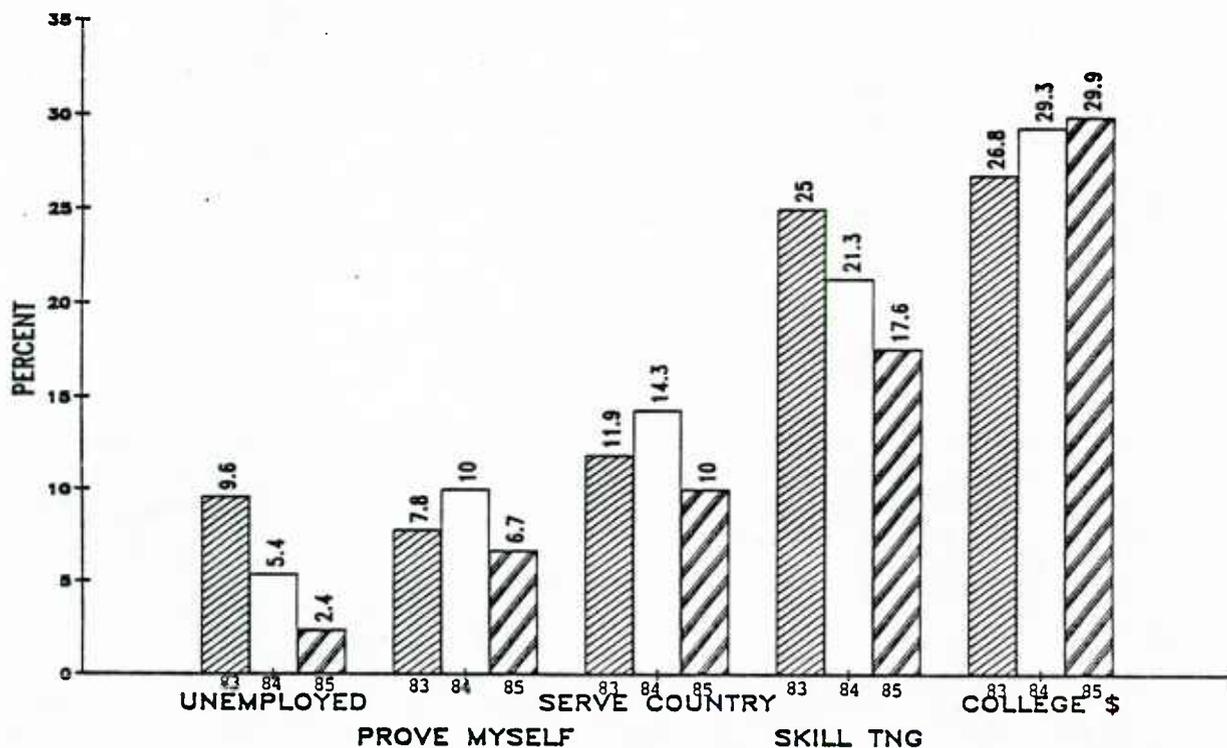


Figure 12. The most important reasons for enlisting for male recruits who are high school graduates and score in the upper half on AFQT

SOURCE: Army Research Institute, ARI Survey of Army Recruits, 1983, 1984, and 1985.

Other studies have shown that educational assistance provided to veterans greatly benefit the society (Edison, 1975; Peden, 1977; O'Neill, 1977; Fernandez, 1980). An investigation by the United States Senate (1976) reported that "for each dollar spent in educational benefits...the Federal government has received from \$3 to \$6 in additional revenues from veterans whose education has given them increased earning capacity."

As shown in figure 13, the new GI Bill, which started in July 1985, has produced positive results for all the services and has helped the Army the most. Moreover, as shown in figure 14, the increase in high quality recruits seems to be proportional to the participation in the GI Bill by Army, Navy, and Marine Corps recruits.

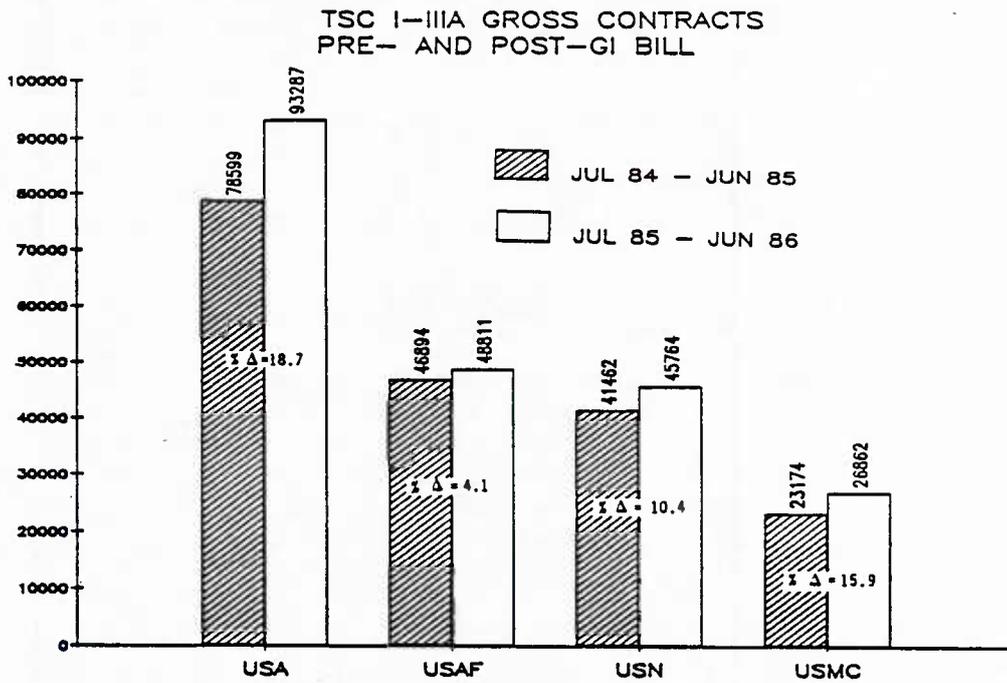


Figure 13. Initial enlistment contracts for recruits scoring in the upper half on the AFQT, one year before and one year after the initiation of the new GI Bill

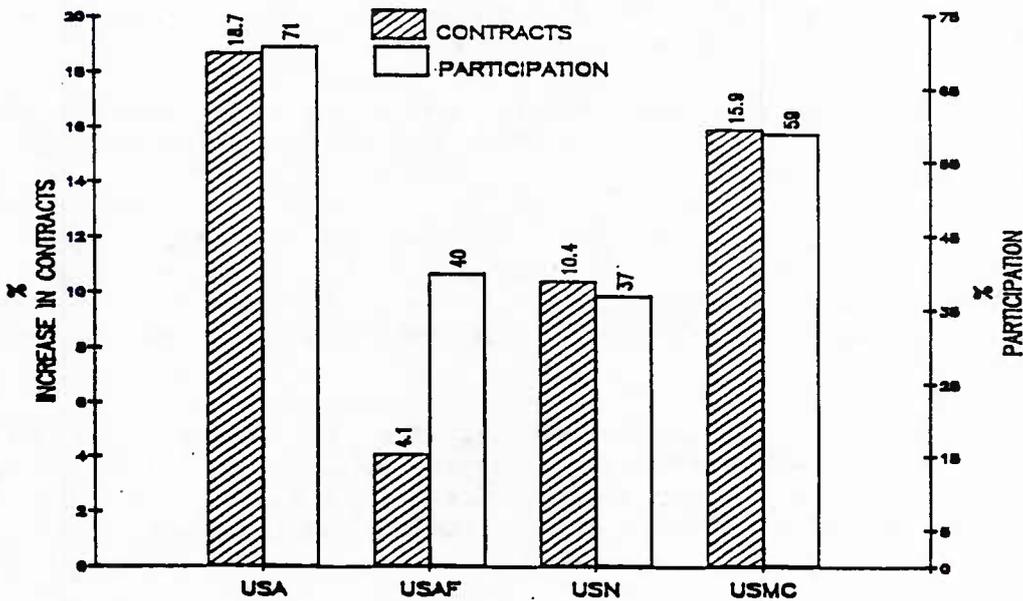


Figure 14. Comparison of the increase in TSC I-III A enlistment contracts and participation in the new GI Bill by recruits in each branch of military service

Not only are educational enlistment incentives more cost-effective than bonuses and general pay increases, they also contribute every bit as much to the growth of the nation's human capital as the loans and grants disbursed annually by the Department of Education.

There would be strong reasons to question national priorities if the young people who serve their country are begrudged the approximately \$100 million in educational assistance requested by the Army for an annual cohort, while billions are handed out by the Department of Education without asking anything in return.

The Common Goals of Educators and Defense Officials

More than 10 million people are expected to go to college in the next few years. The Army, with its educational assistance program, wants to increase that number by making it an acceptable practice for our college-bound youth to serve their country, and in the process become emotionally and financially better prepared for college. In the long run, our nation cannot afford to exclude the best of its youth from military service. We want to help the educators and we need your help to reach our common goals.

The first and foremost of these goals must be national defense. If we cannot continue to enjoy our freedom and way of life, nothing else much matters. The other important common goal we share is to further the quality of education of our youth. High quality education is essential for effective national defense and for a healthy national economy in an increasingly technological world.

The educational assistance provided by the Army is, as stated, every bit as effective as other educational assistance programs. We would, therefore, ask your support for making permanent the current GI Bill test program and continuing the Army College Fund, and also giving some preference to veterans for the assistance provided by the Department of Education.

The Army wants to help educators by encouraging high school students to stay in school and graduate, and is looking into various advertising options to help educators with this problem.

On the other hand, the Army needs the help of educators so recruiters can gain access to high schools and to increase testing of high school students with the Armed Services Vocational Aptitude Test. The results of this test are useful for career counselors in high schools and reduce the cost to the taxpayers of recruiting.

~~Educators and the military must work together~~ to formulate and implement integrated education, manpower, and defense policies that best serve our nation. We have already made great progress in sustaining our military services with smart, well-educated young people, but more must be accomplished.

The Challenge Ahead

It is quite clear that the Army must continue the improvement in recruiting the quality that is needed not only to bring its manpower quality up to parity with its sister services and other modern armies, but also to the quality that is adequate for a relatively small peacetime cadre Army that must provide the non-commissioned-officer leadership and hard-to-learn skills for the mobilization Army.

The United States, with its human and material resources, is quite capable of fielding an Army that is second to none. To accomplish this, a true understanding must be gained of what it takes to adequately provide for the national defense, especially of the trade-offs between soldier quality and hardware quantity. Policies must be established that place military services "in a new social and moral context, one which reconciles citizen rights with citizen duties," as advocated by Moskos (1981).

Then, we as a nation must rededicate ourselves to excellence and emphasize and promote policies that lead to the nurturing of the best this country has to offer. Finally, we must muster the will to put into place national manpower, defense, and education policies and programs that allow us to build an Army that is equal to any challenge.

It is propitious for our nation that an increasingly larger number of young people are responding to the latest version of the Army's famed Uncle Sam poster, where the words "I want you" have been replaced by "If not you, who?" They have decided that our country is, indeed, worth defending and, no matter what the benefits or sacrifices of military service, they realize that it is up to them to meet the challenge.

REFERENCES

- ✓ Binkin, Martin. Military Technology and Defense Manpower. Washington: The Brookings Institution, 1986.
- Dupuy, T. N., et al. Comparative Analysis, Arab and Israeli Combat Performance, 1967 and 1973 Wars. AD B012740L. Dunn Loring, VA: Historical Evaluation and Research Organization (HERO), June 1976.
- Edison, John O. "Testimony Before U.S. Senate Subcommittee on Readjustment, Education, and Employment of the Committee on Veterans Affairs," Congressional Record. Washington: October 2, 1975.
- ✓ Egbert, Robert L., et al. Fighter I: A Study of Effective and Ineffective Combat Performance. HumRRO Special Report 13. AD 158581. Presidio of Monterey, CA: U.S. Army Leadership Human Research Unit, under the technical supervision of the George Washington University Human Resources Research Office, 1958.
- ✓ Fernandez, Richard L. Issues in the Use of Post-Service Educational Benefits as Enlistment Incentives. N-1510-MRAL. AD A089717. Santa Monica, CA: Rand Corporation, July 1980.
- Gal, Reuven. "Characteristics of Heroism," in S. Breznitz, ed., Stress in Israel. New York: Van Nostrand Reinhold, 1982.
- Ginzberg, Eli, et al. Breakdown and Recovery. Vol. II of The Ineffective Soldier: Lessons for Management and the Nation. 3 Vols. New York: Columbia University Press, 1959(a).
- Ginzberg, Eli, et al. The Lost Divisions. Vol. I of The Ineffective Soldier: Lessons for Management and the Nation. 3 Vols. New York: Columbia University Press, 1959(b).
- Ginzberg, Eli, et al. Patterns of Performance. Vol. III of The Ineffective Soldier: Lessons for Management and the Nation. 3 Vols. New York: Columbia University Press, 1959(c).
- Goral, John and Andrea Lipowitz. Attitudes of Youth Toward Military Service in the All Volunteer Force: Results of Gilbert Youth Surveys May 1971 to November 1973. MR 75-7. Alexandria, VA: Manpower Research and Data Analysis Entry Survey Research Division, September 1974.
- Hovland, Carl I, Arthur A. Lumsdaine, and Fred D. Sheffield. Experiments in Mass Communication. Vol. III of Studies in Social Psychology in World War II, Frederick Osborn et al., ed. 4 Vols. Princeton, NJ: Princeton University Press, 1949.
- Institute of Social Research. 1976 Study on the GI Bill. Ann Arbor, MI: University of Michigan, 1976.

REFERENCES (CONTINUED)

- Janowitz, Morris. The Reconstruction of Patriotism: Education for Civil Consciousness. Chicago: The University of Chicago Press, 1983.
- Kupperman, Robert H. and William J. Taylor, Jr. Strategic Requirements for the Army to the Year 2000. The Center for Strategic and International Studies, Georgetown University. Lexington, MA: Lexington Books, 1984.
- Lining, Al. Fact Sheet on Soldier Issues on Army 21. Indianapolis, IN: U.S. Army Soldier Support Center, October 1, 1985.
- Marshall, S. L. A. Men Against Fire. Washington: Infantry Journal Press, 1947.
- McFann, H. H. HumRRO Research on Project 100,000. Professional Paper 37-69. AD 703516. Alexandria, VA: Human Resources Research Organization, December 1969.
- Moskos, Charles C. "Citizen Soldier and National Service," in Gerald Suttles and Mayer N. Zald, ed., Challenge of Social Control. Norwood, NJ: Ablex Pub., 1985.
- Moskos, Charles C. "Making the All-Volunteer Force Work: A National Service Approach." Foreign Affairs, Fall 1981, Vol. 60, No. 1, pp. 17-34.
- O'Neill, Dave M. "Voucher Funding of Training Programs: Evidence from the GI Bill." Journal of Human Resources. 12:4 (Fall 1977), pp. 423-445.
- Ostovich, Rudolph, II, et al. Soldier-Machine Interface Requirements ("Complexity"). Vol. I, Main Report. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Development Activity, May 1982.
- Pascal, Anthony, et al. Men and Arms in the Middle East: The Human Factor in Military Modernization. R-2460-NA. AD A072955. Santa Monica, CA: The Rand Corporation, June 1979.
- Peden, Joe D. The GI Bill: Is Its Role as an Incentive for Enlistment Its Most Important Product? Report No. 169. AD A089717. Maxwell AFB, AL: Air War College, April 1977.
- Ratliff, Forrest R., and James A. Earles. Research on the Management, Training, and Utilization of Low-Aptitude Personnel: An Annotated Bibliography. AFHRL-TR-76-69. AD A942605. Lackland Air Force Base, TX: Personnel Research Division, Air Force Human Resources Laboratory, December 1976.
- Stouffer, Samuel A., et al. The American Soldier: Adjustment During Army Life. Vol. I of Studies in Social Psychology in World War II, Frederick Osborn et al, ed. 4 Vols. Princeton, NJ: Princeton University Press, 1949(a).

REFERENCES (CONTINUED)

- Stouffer, Samuel A. The American Soldier: Combat and Its Aftermath. Vol. II of Studies in Social Psychology in World War II, Frederick Osborn et al, eds. 4 Vols. Princeton, NJ: Princeton University Press, 1949(b).
- Stouffer, Samuel A. Measurement and Prediction. Vol. IV of Studies in Social Psychology in World War II, Frederick Osborn et al, eds. 4 Vols. Princeton, NJ: Princeton University Press, 1949(c).
- Toomepuu, Juri. "Costs and Benefits of Quality Soldiers, A Critical Review of the CBO Report" Quality Soldiers: Costs of Manning the Active Army. Fort Sheridan, IL: U.S. Army Recruiting Command, 1986(a).
- ✓ Toomepuu, Juri. Military Manpower Quality Issues. Professional Paper Presented at the International Conference of the Inter-University Seminar on Armed Forces and Society. Chicago, IL: October 19, 1985.
- Toomepuu, Juri. Soldier Capability - Army Combat Effectiveness (SCACE), Vol. I, Main Report. AD B062417. Fort Benjamin Harison, IN: U.S. Army Soldier Support Center, April 1981.
- ✓ Toomepuu, Juri. "The Effects of Defense Educational Assistance Programs." Information Paper. Fort Sheridan, IL: U.S. Army Recruiting Command, October 2, 1986(b).
- U.S. Department of the Army. Analysis of Combat Data - 1973 Mideast War (U). Final Report, Vol. III, Appendix H - Comparison of USSR Doctrine and Arab Tactics (U), and Appendix I - Human Factors (U). 8 Vols. AD C012268L. Fort Leavenworth, KS: U.S. Army Combined Arms Center, Special Readiness Study Group, June 1974 (SECRET), (a).
- U.S. Department of the Army. Analysis of Combat Data - 1973 Mideast War (U), Final Report, Vol. III, Appendix J - Recommendations (U). 8 Vols. AD C0122691L. Fort Leavenworth, KS: U.S. Army Combined Arms Center, Special Readiness Study Group, July 1974 (SECRET), (b).
- ✓ U.S. Department of the Army. Marginal Man and Military Service: A Review. Washington: Government Printing Office, January 1965.
- ✓ U.S. Department of the Army. Quality Soldier Study. Fort Monroe, VA: U.S. Army Training and Doctrine Command. Deputy Chief of Staff, Personnel, Volunteer Army Division, May 1975.
- U.S. Department of Defense. Soviet Military Power. Washington: U.S. Government Printing Office, 1986.
- U.S. General Accounting Office. AWOL in the Military: A Serious and Costly Problem. FPCD-78-52. Washington: The Comptroller General, March 30, 1979.

REFERENCES (CONTINUED)

U.S. Senate. "Senate Report No. 94-1243," September 16, 1976, reported in U.S. Code Congressional and Administrative News. 74th Congress, 2nd Session, No. 5, 1976, pp. 5241-5373.

✓ Vineberg, Robert, and Elaine Taylor. Performance in Four Jobs: The Role of Mental Ability and Experience. Professional Paper 31-70. Alexandria, VA: Human Resources Research Organization, December 1970.



IF NOT YOU, WHO?

If you believe this country needs the Army,
you can't help but believe that it needs soldiers.

Who will these soldiers be?

Don't look for a volunteer. After all, with your
education, a bright future, and your dreams, you have a personal stake
in the future of this country.

And a personal duty to serve it.

That's right, though military service is no longer
an obligation, it is no less a duty.

And in spite of all the bonuses, benefits, travel
and excitement of being a soldier, fulfilling your duty is
the most fulfilling part of all.

Think about it.

ARMY.
BE ALL YOU CAN BE.

U233445