Technical Report 70-18

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Robert Vineberg, Elaine N. Taylor, and John S. Caylor

HumRRO Division No. 3

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Office, Chief of Research and Development Department of the Army

Contract DAHC 19-70-C-0012



**HumRRO**

**HUMAN RESOURCES RESEARCH ORGANIZATION**



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HumRRO Division No. 3
Presidio of Monterey, California

**HUMAN RESOURCES RESEARCH ORGANIZATION**

Technical Report 70-18
Work Unit UTILITY

The Human Resources Research Organization (HumRRO) is a nonprofit corporation established in 1969 to conduct research in the field of training and education. It is a continuation of The George Washington University Human Resources Research Office. HumRRO's general purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation. HumRRO's mission in work performed under contract with the Department of the Army is to conduct research in the fields of training, motivation, and leadership.



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# FOREWORD

HumRRO Work Unit UTILITY was initiated in January 1967 in order to provide information about the Army performance and characteristics of marginal personnel, men whose scores on the Armed Forces Qualification Tests were in the low levels. Its objectives were (a) to find out how men in Mental Category IV compared with men in other mental categories in the performance of selected Army jobs, and (b) to identify different factors associated with satisfactory performance in different mental category groupings—specifically, to explore the relationships among a man's background, personal characteristics, Army experiences, and his job performance.

The UTILITY research has been conducted by HumRRO Division No. 3 at the Presidio of Monterey, California, with Dr. Howard McFann as Director. Dr. Robert Vineberg was the Work Unit Leader. Members of the research team at various times have included Dr. Elaine N. Taylor, Dr. John S. Caylor, Miss Annette K. Mahikoa, Dr. S. James Goffard, Dr. Thomas G. Sticht, Dr. Joseph S. Ward, Dr. Herbert G. Gerjuoy, Mr. Donald F. Polden, and Mr. Leon E. Guyton.

Military support for the study was provided by the U.S. Army Training Center Human Research Unit. Military Chief of the Unit at the beginning of the research was LTC David S. Marshall; during the period of data collection and early analysis, LTC Robert J. Emswiler was Unit Chief; the present Chief is LTC Ullrich Hermann.

The extensive findings from this research are being reported in a series of publications. This, the first report, describes the rationale, research design, and general chronology of research events. Subsequent reports will provide descriptions of the instruments used in the study and their development; comparisons of the performance of men in different mental categories with different amounts of job experience; analyses of personal and background characteristics, and of effective and ineffective performance; analyses of the role of literacy variables in performance; and analyses of the interrelationships among different performance criteria.

Enlisted men assigned to the project for test development and administration included SFC Thomas E. Mendoza, SFC Willett B. Raynor, SFC Melvin P. Johnson, SSG Johnny Moore, SSG Veith G. Fullmer, SSG Warren Heffentrager, SSF Maurice McQuinn, Jr., SSG David Miller, SSG Terry M. Dunnigan, SSG Richard L. Brogdon, SSG Bobby Lochart, SGT Jack A. Smith, SGT James M. Morgan, SGT Bruce E. Barnes, SGT James R. Horvath, SFT Robert Juarez, SGT John S. Tucker, SP5 Christopher Hungerland, SP4 Richard Wuerthner, SP4 Richard Ferrington, SP4 Steven N. Street, SP4 William Yanda, and PFC Larry B. Greizel. Particular mention should be made of SGT Gerald G. Lynch and SP5 Alva J. Tucker, both members of the test development and administration team, who contributed to the project far beyond duty requirements.

HumRRO research for the Department of the Army is conducted under Contract DAHC 19-70-C-0012. Training, Motivation, Leadership Research is conducted under Army Project 2Q062107A712.

Meredith P. Crawford
President
Human Resources Research Organization

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# SUMMARY

## MILITARY PROBLEM

In October 1966 the Department of Defense began accepting into the services men with lower aptitudes as part of a massive social experiment, designed both to make effective soldiers of many men who had been considered marginal in ability and to provide them with the training necessary to enable them to lead productive lives as citizens following their military service. Project 100,000, as the experiment was named, was to accept into the Armed Forces, each year, 100,000 men who otherwise would have been ineligible for military service. In undertaking this program, minimum standards of military performance were to be maintained and the overall effectiveness of the services was not to be diminished.

Sizable numbers of men with low aptitude scores have shown that they can perform effectively. In the past, when standards of selection were modified to accept more men of lower mental ability, as was necessary in times of mobilization, many of the men accepted proved to be quite effective. Unfortunately, there never has been a systematic study that identified the characteristics of marginal men who are suitable for the Armed Forces, and the kinds of jobs best suited to them.

## RESEARCH OBJECTIVES

Work Unit UTILITY was designed to provide information about the performance and characteristics of marginal men in the Army. The first objective of the program was to find out how men in Mental Category IV and in other mental categories compared in the performance of selected Army jobs. These comparisons were to include a mapping of areas within jobs where greater and lesser degrees of competence were displayed, in order to provide some information about variations among men in capabilities or skills. Thus, a basis would be available for estimating how other jobs, not included in the study, might be performed by men in the different mental groups.

The second objective was to identify different factors associated with satisfactory performance in different mental category groupings. The intent was to explore both the role of a man's background and personal characteristics and his more general Army experiences (such as the type of training he has received and the length of time he has spent in the job) as they relate to performance.

## RESEARCH APPROACH

Five MOSs (Armor Crewman, General Vehicle Repairman, Unit and Organizational Supply Specialist, Medical Specialist, and Cook) were selected for studying the performance and characteristics of both marginal men and comparison groups from the upper aptitude levels. Approximately 375 men were studied in each MOS. Information about the job effectiveness of each man was obtained through job sample tests, job knowledge tests, and supervisor ratings. Information about each man's background, personal characteristics, and Army experience and training was obtained through biographical questionnaires, a battery of published and experimental tests, and Army records. Information about each man's typical daily job activities was obtained through questionnaires administered to the men themselves and to their supervisors.

Since the research resulted in extensive information dealing with a variety of topics that are best treated separately, the study is being reported as a series. This report, the first in the series, describes the rationale, research design, and general chronology of

research events in the study, and includes a general description of the background and personal characteristics of the sample.

Research was initiated in January 1967. In May 1967 the MOSs to be included in the study were selected: *Armor Crewman*, to provide information about performance in a machine-ascendant job; *General Vehicle Repairman*, information about mechanical maintenance jobs requiring diagnostic and interpretive skills; Unit and Organizational *Supply Specialist*, information about clerical jobs; *Medical Specialist*, information about a job in which proceduralized tasks are directed toward the care and treatment of individuals; *Cook*, information about a job typically requiring the reading and following of specified procedures.

Development of job sample and job knowledge tests for these MOSs was begun in July 1967 and completed in April 1968. Data collection was begun in July 1968 and completed in June 1969 with testing conducted at Fort Hood, Texas; Fort Ord, California; Fort Carson, Colorado; 7th U.S. Army, USAREUR; and selected Army hospitals in the United States.

## CHARACTERISTICS OF THE SAMPLE

The initial general analysis of the background and personal characteristics of the sample indicated that:

(1) Men at the lower end of the aptitude range were more likely to come from less culturally advantaged segments of the population.

(2) A man's AFQT score was highly related to the number of years of school he had completed and to his aptitude test and aptitude area scores.

(3) Armor Crewman, Repairman, and Cook had the poorest educational records. Supply and Medical Specialists had the best educational records.

(4) No relationship between AFQT score and marital status was found.

(5) There was little relationship between AFQT score and the grade attained in the Army.

(6) The general ordering of aptitude and aptitude area scores was closely related to AFQT. Supply Specialist had the highest mean AFQT score and Cook had the lowest. Repairman had the highest mean scores in tests measuring mechanical and electronic aptitude and in related aptitude areas. On the majority of remaining tests and aptitude areas, Supply Specialist had the highest mean scores. Cook, overall, had the lowest aptitude and aptitude area scores.

(7) Most of the Negroes in the sample were in the lower mental categories, with the proportion of Negroes to Caucasians diminishing steadily as AFQT level increased.

(8) In all of the jobs studied, a proportionately larger number of Negroes tended to remain in the Army.

(9) A lower proportion of Negroes and men entering the service as part of Project 100,000 appeared to be receiving assignments as General Vehicle Repairman—a job providing training and experience for an important civilian occupation.

(10) Men in the General Vehicle Repairman MOS tended to have the least military experience, whereas Medical Specialists tended to have the most. Repairmen may leave the Army more readily since they possess skills that provide them with good civilian job opportunities, whereas Medical Specialists may tend to remain in the Army because the civilian jobs for which they qualify are less attractive to them.

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# Performance in Five Army Jobs by Men at Different Aptitude (AFQT) Levels: I. Purpose and Design of Study

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# INTRODUCTION

Prior to October 1966, mental standards for acceptance into the Armed Services varied mainly in accordance with supply and demand. In times of mobilization, standards were usually lowered as more men were needed; when an emergency had passed, standards were again raised.

The fact that one-third of this nation's youth had been declared unfit for military service had been a matter of growing concern for a number of years. In October 1966 the Department of Defense began accepting men of lower aptitude, not solely because of a need for more men for the Vietnam conflict, but also because it had initiated a massive social experiment. This experiment was designed to provide many men who had generally been considered marginal in ability[1] with the necessary education and training to equip them both to be effective soldiers and later to lead productive lives as citizens.

The aim of Project 100,000, as the experiment was named, was to accept into the Armed Forces each year 100,000 men who otherwise would have been ineligible for military service. This program had as its objectives:[2]

(1) Reducing excessively high standards that were both discriminatory and wasteful of manpower.

(2) Producing satisfactory servicemen among individuals with generally lower aptitudes (often found among the culturally disadvantaged) while providing these persons with skills they could use on their return to civilian life.

(3) Learning how to best train and use men from the lower aptitude segment of the manpower pool and thereby prepare for times of full mobilization when these men would be required in the services.

An important consideration in undertaking this program was that minimum standards of military performance be maintained and that the overall effectiveness of the services not be diminished. Several factors were implicit in the conviction that performance standards could be maintained while acceptance standards, defined largely in terms of aptitude test scores, were lowered.

First, for several reasons *aptitude test scores are not perfectly related to the actual performance of a job.* (a) Although aptitude tests have generally been validated on, and therefore best predict the relative success of men in training or classroom situations, the characteristics that contribute to a man's success in a classroom are often of lesser importance when he reaches a job. Thus, Robert McNamara, then Secretary of Defense, introduced the Project 100,000 program with this statement:

> One of the Department's key concepts is that traditional classroom training is often largely irrelevant to actual on-the-job performance requirements.[3]

(b) Reading and verbal ability, fairly well predicted by aptitude tests, typically play a major role in conventional instructional situations, particularly as they facilitate the understanding and assimilation of information and contribute to success in written examinations. Motivational and attitudinal factors, not predicted by aptitude tests, frequently emerge as more important determinants of job effectiveness than verbal ability or even technical proficiency itself. (c) Aptitude tests scores, while devised to measure a

[1] As well as a smaller proportion who were physically marginal, but whose defects were remediable.

[2] Office of Secretary of Defense, Assistant Secretary of Defense (Manpower). "The Report of the Reception Processing Seminar," Fort Bragg, N.C., April 1967.

[3] Robert S. McNamara, Address, Veterans of Foreign Wars, New York City, 23 August 1966.

man's intrinsic ability, are highly influenced by an individual's prior educational, cultural, and social experiences and opportunities. The less often a person has been exposed to the kinds of materials upon which the test items are based—indeed, the less familiarity he has with taking tests themselves—the more likely he is to make a low score. Thus, conventional aptitude tests tend to be less valid for providing estimates of the capabilities of culturally deprived individuals. Such individuals were expected to be found in large numbers in Project 100,000.

Second, evidence has shown that *sizable numbers of men with low aptitude scores can perform effectively*. In the past, when standards of selection were modified to accept more men of lower mental ability, as was necessary in times of mobilization, many—although not all—of the men accepted proved to be quite effective. Unfortunately, while experience has demonstrated that men with low aptitude test scores can be used in the Armed Forces, there never has been a systematic study identifying the kinds of marginal men who are suitable and the kinds of jobs best suited to them. Thus, the Department of the Army study, *Marginal Man and Military Service*, documented the situation and described it as follows:

> Since 1941, except perhaps for 3 or 4 years immediately after World War II, there has been fairly consistent concern with the problem of utilizing marginals in the Armed Services. Yet, arguments for and against accepting them for military service have been derived largely from emotional attitudes or were based on fragmentary and/or biased data. The few programs designed to answer practical questions about the advantages and disadvantages of accepting such men in the Armed Services were stopped before they were completed or were quite restricted in scope.
>
> Information about these programs is scattered, often not clearly identified as applying to marginal manpower, and at times quite incomplete. In December 1964, roughly the same amount of information of proved worth is available as in 1941 . . .[4]

This same study clearly defined the requirements of a thoroughgoing investigation of marginal man. It summarized as follows:

> . . . the evaluations should in the end serve one comprehensive objective: to determine who, within a heterogeneous group of men all of whom are judged marginal, with what kind of training, can perform what jobs in the Army, and how well. This kind of evaluation has never been done.

Work Unit UTILITY, initiated in January 1967 as part of Project 100,000, was designed to provide information about the performance and characteristics of marginal men in the Army. Specifically, it had two major objectives. The first was to find out how men in Mental Category IV[5] and in other mental categories compared in the performance of selected Army jobs. These comparisons were to include a mapping of areas within jobs where greater and lesser degrees of competence were displayed. The purpose of this part of the analysis was to provide information about how men varied in capabilities or skills, and thus to provide a basis for estimating how other jobs, not included in the study, might be performed by men in the different mental groups.

The second objective was to identify different factors associated with satisfactory performance in different mental category groupings. The intent was to explore both the role of a man's background and personal characteristics and his more general Army experiences (such as the type of training he has received and the length of time he has spent in the job) as they relate to performance.

[4] Department of the Army. *Marginal Man and Military Service, A Review*, Washington, December 1965.

[5] The classification system is described in the following section.

For these objectives to be reached, a fundamental requirement was that job sample tests would be the primary measure of job capability. Further, job sample testing was to be undertaken with men who were working in the job rather than with men in some phase of training for the job.

Largely through the impetus of Project 100,000, a considerable and diverse body of information is being amassed about men all along the Armed Forces Qualification Test (AFQT) range, with particular attention to those of lower mental ability. Some of this information, embodied in statistics on AWOL rates and other offenses, deals with questions of general military suitability. Most available information, however, is descriptive of performance in training situations—for example, success in Basic Combat Training (BCT) and Advanced Individual Training (AIT). Information about how jobs are actually being performed is less accessible and most often, where it exists, practical necessity dictates that it be derived from supervisor ratings rather than from the direct measurement of job behavior. The emphasis in Work Unit UTILITY on job sample testing of job incumbents provides needed information which is otherwise not available.

This report, the first in a series, serves as an introduction to the study and its findings, and describes the general characteristics of the sample. The rationale, research design, and general chronology of research events are also described. Some of the subsequent reports will be devoted to descriptions of the development of test instruments and comparisons of the performance of men in different mental categories and men with different amounts of job experience. Other reports will deal with analyses of the role of literacy variables, the personal and background characteristics of effective and ineffective performers, and the interrelationships among different performance criteria (job sample tests, job knowledge tests, and supervisor ratings).

## DEFINITION OF THE POPULATION

The overall goal of the study was to provide as broad an analysis as possible of the performance capabilities and individual characteristics of men at the lower end of the general aptitude scale. The Armed Forces Qualification Test (AFQT) is the instrument used to measure a man's general aptitude for military service. As part of the process by which eligibility for service is determined, every man is classified into one of five mental groups on the basis of his score on this test:

| Mental Group | AFQT Percentile Score |
|---|---|
| I | 93-99 |
| II | 65-92 |
| III | 31-64 |
| IV | 10-30 |
| V | 0-9 |

Men who place in Groups IV and V are considered marginal and their acceptance into the military is dependent upon the minimum standard prevailing at that particular time.[6]

In this study the performance of marginal men needed to be viewed in relation to that of men who placed in the mental group range historically acceptable to the Army. Accordingly, this study included men in Mental Groups I-III.

[6]The manner in which standards were modified for men in Mental Groups IV and V with the advent of Project 100,000 is specified in "The Report of the Reception Processing Seminar," Assistant Secretary of Defense (Manpower), *op. cit.*

It was anticipated that a man's performance would vary depending on how long he had worked in a job. Further, it seemed likely that the magnitude of any differences that might be observed among mental groups would change with amount of total time accumulated working in the Military Occupational Specialty (MOS). Therefore, the study included men with different amounts of job experience.

Since the inclusion of men with various amounts of job experience was necessary for the study, it was not possible to restrict the lower aptitude portion of the sample to men who had come into the Army as part of Project 100,000. At the time this research was undertaken, Project 100,000 men generally would not have acquired more than one to two years of experience in any given MOS. Further, restricting the lower aptitude portion of the sample to Project 100,000 men would have severely limited the number of low aptitude men available in any specific MOS. Fortunately, many lower aptitude men who had come into the Army prior to Project 100,000 were available, and they made up the majority of the low aptitude sample; of the 915 men in Mental Groups IV[7] and V in the study, 139 were from Project 100,000.

To provide a more general picture of the capabilities of lower aptitude individuals, men working in different kinds of jobs needed to be considered. The sample included men from five distinctly different MOSs.

The type of MOS training a man had received was not considered in selecting subjects for study. Thus, the sample included men who had received all of their training while on the job, as well as others who had received the more formal Advanced Individual Training or Combat Support Training before coming to the job. A small portion of the sample had received training at Army Technical Schools.

The plan for sampling required that an equal number of men in Mental Group IV and Mental Group I-III be represented, and further, that amount of job experience be used as a control variable to match pairs of men from these two mental group levels. In order to increase the likelihood of adequate sampling for time on the job and to permit analysis of the large number of measures to be obtained for each subject, a minimum of 250 pairs of subjects in each MOS was initially planned. Eventually this figure had to be revised downward to a minimum of 180 pairs of men in each MOS, because of limitations in time, funding, and authority to test in certain military units.

In summary, the sample consisted of men from the entire AFQT range, with those of lower aptitude not restricted to men accepted under Project 100,000. The sample was further divided into five subsamples, one for each of five specific military jobs. Men with different amounts of job experience and different types of training were included in each subsample.

## SELECTION OF JOBS FOR STUDY

A first step was to select the MOSs to be represented in the study. It was desirable that the following requirements be met in selecting the MOSs:

(1) **Representation of different job characteristics.** The jobs, taken together, should cover as broad a range as possible of job types and task complexity.

(2) **Counterparts in civilian occupations.** One of the objectives of Project 100,000 is to provide lower aptitude and culturally deprived men with skills and knowledges that will improve their ability to lead more productive lives in general. Insofar as possible, jobs selected for the study should have counterparts in civilian

[7] Fewer than 2% of the total sample were in Mental Group V. Because of this small number, these men were included in Group IV in the analyses and discussions in this report.

occupations to maximize the likelihood of research findings having applicability beyond the military setting.

(3) **Highly populated jobs.** Each job should have relatively large numbers of men assigned to it within the Army so as to provide an adequate sample of men for the study. This would also increase the practical use of any research findings that might prove to be specific to the job studied.

(4) **Highly populated with low aptitude men.** To the extent possible without reducing the range of job types covered, jobs should be selected in which reasonably large numbers of lower aptitude men are assigned. This would increase the likelihood that both a large and a representative sample of lower aptitude men could be obtained for the study.

(5) **Generality across military services.** Insofar as possible, jobs should be chosen that have counterparts in each military service. While the study is confined to subjects within the Army, the results are intended to apply to all services, as Project 100,000 is a Department of Defense cross-service program.

With the establishment of these requirements, a survey of men in various MOSs was undertaken. In March 1967 the U.S. Army Data Support Command provided information on a random sample of approximately 5,000 men from Mental Categories I-III and 5,000 men from Mental Category IV who were in the second or third year of their first tour of duty as of 31 December 1966. This sample was limited in this manner because it was believed that the majority of men who would ultimately be subjects in the study would come from such a group.

Partial results of this survey, showing the percentage of men in Mental Categories I-III and Mental Category IV for those MOSs that were densely populated are shown in Table 1.

Assuming that the Data Support Command sample was a reasonable reflection of the distribution of MOS assignments and Mental Category Groups, these figures provided a basis for final selection of jobs to be studied. It was recognized that the proportion of men in Mental Category IV might increase as Project 100,000 entered into successive stages. In fact, in April 1969, when the last phase of UTILITY data collection was initiated, the proportion of Mental Category IVs among Armor Crewmen had increased from 25% to 39% and among Supply Specialists from 25% to 32%.

Consideration of the MOS density information and the various requirements to be met to provide generality of results led to the selection of several possible MOSs. After consultation with the Office of Assistant Secretary of Defense (Manpower),[8] the following were chosen:

| MOS Code | Title |
|---|---|
| 11E | Armor Crewman |
| 63C | General Vehicle Repairman[9] |
| 76Y | Unit and Organizational Supply Specialist[9] |
| 91B | Medical Specialist |
| 94B | Cook |

The Armor Crewman provides information about a combat specialty with job duties that are highly procedural and dictated in large degree by equipment and combat mission.

[8] Now Office of Assistant Secretary of Defense (Manpower and Reserve Affairs).

[9] In July 1967, the Vehicle Repairman and Supply Career Groups were reorganized. MOS 63C, formerly Track Vehicle Mechanic, became General Vehicle Repairman; MOS 76K, formerly General Supply Specialist became MOS 76Y, Unit and Organizational Supply Specialist. See Department of the Army, *Manual of Enlis'ed Military Occupational Specialties*, Army Regulation (AR) 611-201, Washington, April 1966, with amendments.

Table 1

**Percentage of Men in Mental Categories I-III and IV in High Density MOSs[a]**

| | MOS Title[b] | MOS Code | Men in Mental Category | |
|---|---|---|---|---|
| | | | I-III (%) | IV (%) |
| | Field Artillery Crewmen | 13B | 64 | 36 |
| | Armor Intelligence Specialist | 11D | 66 | 34 |
| | Field Wireman | 36A | 68 | 32 |
| | Food Service Apprentice | 94A | 69 | 31 |
| | Supply Clerk | 76A | 69 | 31 |
| | Field Artillery, Basic | 13A | 69 | 31 |
| | Light Weapons Infantryman | 11B | 71 | 29 |
| | Heavy Vehicle Driver | 64B | 71 | 29 |
| | Pioneer | 12A | 72 | 28 |
| | Supply Handler | 56A | 73 | 27 |
| ** | COOK | 94B | 74 | 26 |
| | Light Vehicle Driver | 64A | 75 | 25 |
| ** | GENERAL SUPPLY SPECIALIST | 76K | 75 | 25 |
| ** | ARMOR CREWMAN | 11E | 75 | 25 |
| | Combat Engineer | 12B | 75 | 25 |
| | Lineman | 36C | 75 | 25 |
| | Infantry Direct Fire | 11H | 75 | 25 |
| | Infantry Indirect Fire | 11C | 76 | 24 |
| | Medical Corpsman | 91A | 78 | 22 |
| | Construction Machine Operator | 62E | 79 | 21 |
| | Communications Center Specialist | 72B | 80 | 20 |
| | Wheel Vehicle Mechanic | 63B | 82 | 18 |
| | Relay and Carrier Attendant | 31M | 84 | 16 |
| | Automotive Maintenance Apprentice | 63A | 84 | 16 |
| | Hercules Crewman | 16B | 86 | 14 |
| | Radio Teletype Operator | 05C | 86 | 14 |
| ** | TRACK VEHICLE MECHANIC | 63C | 87 | 13 |
| ** | MEDICAL SPECIALIST | 91B | 88 | 12 |
| | Clerk Typist | 71B | 90 | 10 |
| | Personnel Specialist | 71H | 91 | 9 |

[a]Based on a sample of men in the second or third year of their first tour, as of December 1966.

[b]**Indicates MOS selected for study.

The MOS may be considered machine-ascendant in that job behaviors principally involve sequences of interaction between man and machine. Armor Crewman is the only MOS selected that did not have counterparts in all the other military services or in civilian occupations.

The General Vehicle Repairman (hereafter referred to as Repairman) provides information about mechanical maintenance jobs requiring diagnostic and interpretive skills.

Unit and Organizational Supply Specialist (hereafter referred to as Supply Specialist) provides information about clerical jobs. This MOS calls primarily for the coordination and recording of information. Data from the Data Support Command sample suggested that other MOSs in the clerical field, such as Clerk or Clerk-Typist, did not have a sufficient number of men in Mental Category IV for the purposes of the study.

The Medical Specialist provides information about a job in which many procedur-alized tasks are directed toward the processing and treatment of individuals. In this man-ascendant job, providing patients with personal service while attending to their medical needs is paramount.

The Cook provides information about a job typically requiring the reading and following of specified procedures (cookbook). Recognition of standards and precision in meeting them are primary characteristics of the job. This MOS also represents a job where men of lower aptitude have frequently been placed.

## DATA SOURCES[10]

The data collected for each subject in the study may be divided into two general classes: (a) military performance criteria and (b) background and personal characteristics.

### CRITERION DATA

Criterion data include general measures of a man's military suitability and specific measures of his job performance and job knowledge. The measures of general suitability were: (a) two supervisor rating instruments—the Enlisted Efficiency Report, used operationally throughout the Army, and an 11-item general acceptance scale developed by HumRRO for this study; (b) information from each man's permanent record (201 File) in regard to misconduct while in the Army. Job performance was measured by job sample performance tests, and job knowledge by multiple choice paper-and-pencil tests.

### BACKGROUND AND PERSONAL CHARACTERISTICS

Information about the subjects was obtained to identify any characteristics that might be associated with successful and unsuccessful performance and that might be useful for predicting the performance of future job candidates. Also, a variety of measures were obtained to describe the sample and provide information that could be used in estimating the generality of the findings.

Data on personal characteristics include background and demographic facts collected from each man's military records (Form 20) and through the administration of biographical questionnaires, aptitude test scores taken from military records (Form 20), and items from a variety of published and experimental paper-and-pencil test instruments that were administered to all participants in the study. The paper-and-pencil tests included a nonverbal measure of intelligence; measures of ability to comprehend, remember, and follow oral directions; a measure of cultural background (approximately equivalent to socioeconomic status); experimental tests believed to measure attributes such as "planfulness" and "persistence;" and tests of reading, arithmetic, and listening comprehension.

[10] Detailed descriptions of each instrument and its development and administration are provided in the second report of this series: "Performance in Five Army Jobs by Men at Different Aptitude (AFQT) Levels: 2. Development and Description of Instruments," HumRRO Technical Report in preparation.

# SAMPLE SELECTION AND DATA COLLECTION PROCEDURES

## DESIGNATION OF UNITS FOR TESTING

It was desirable that subjects to be taken from jobs where they were likely to have been exposed to the fullest range of job demands in their MOS. For this reason, Table of Organization and Equipment (TOE) units whose peacetime mission is to train in preparation for combat or combat support activities were seen as the most appropriate source of subjects. Tanks were part of the equipment that would be needed for testing in two MOSs—the Armor Crewman and the Repairman, which includes maintenance on tanks as well as other vehicles. Therefore, armored or mechanized infantry units were logical choices in which to carry out testing, as all of the MOSs except Medical Specialist can be found in such units.

Also, since relatively large numbers of men working in these jobs would be needed, entire combat divisions were identified as the appropriate military elements in which to organize and conduct the test program. Finally, because job experiences (their intensity and duration) in some MOSs might vary between divisions in the Continental United States (CONUS) and in the Field Army, it was desirable that both kinds of divisions be represented.

Ultimately, Armor Crewmen and Supply Specialists were obtained from the 1st and 2nd Armored Divisions, Fort Hood, Texas; the 5th Infantry Division (Mechanized), Fort Carson, Colorado; and the 4th Armored Division and VII Corps, USAREUR. Repairmen were tested in the 1st and 2nd Armored Divisions, Fort Hood, and the 5th Infantry Division (Mechanized), Fort Carson. The Cook sample came entirely from the 1st and 2nd Armored Divisions, Fort Hood, and Fort Ord, California.[11] The Medical Specialist sample was obtained from several Army Hospitals, all located within the Continental United States.[12]

## IDENTIFICATION AND SELECTION OF THE SAMPLE

The general procedure was to select pairs of men for testing. Each pair included one man in Mental Group IV and one in Mental Group I-III with pair members matched for amount of time on the job to ensure equal amounts of job exposure for Mental Group IV and Mental Group I-III subsamples.

At each location where testing was conducted with Armor Crewmen, Repairmen, Supply Specialists, and Cooks, the first step was to identify potential test subjects, that is, men listed in Divisional Records as possessing a primary or duty MOS in the required job specialties. The actual job duties of these potential subjects were then determined through interviews with their company commanders, or first sergeants and company clerks. All men who were not working daily in the selected MOSs were eliminated as possible subjects. During the same interviews, men who had not been listed in Divisional Records (e.g., newly assigned and reassigned personnel) were added to the list of potential subjects if found to be working in the specialties. The following subclasses of

[11] It was possible to reduce costs by conducting some of the testing of Cooks at Fort Ord where the staff of Work Unit UTILITY is located. Since the job demands of Cooks are highly similar, regardless of whether they are in TOE or other units, this procedure was adopted. Also, this reduced the operational and logistic demands on the Divisions where subsequent testing occurred.

[12] The numbers of men in each MOS tested at each location are shown in Tables 3 and 4 in the section on final composition of the sample.

men in the selected specialties were eliminated as potential subjects: Armor Crewmen who were First Sergeants or who were assigned to Headquarters Companies, Repairmen working as parts clerks, and Supply personnel working as company armorers or in Supply and Transportation Battalions (S&T).[13]

The second step was to obtain the permanent record for each potential subject and determine his score on the Armed Forces Qualification Test. For some subjects, records were not available; for a relatively small number, AFQT scores had not been entered in their records. In the latter cases, AFQT scores were estimated if Verbal, Arithmetic, Shop Mechanics, and Pattern Analysis scores from the Army Classification Battery or Army Qualification Battery were available.[14]

The third step was to select the actual pairs of subjects to be tested. Since there were typically more men available in Mental Groups I-III than there were in Mental Group IV, the procedure for Armor Crewmen, Repairmen, Supply Specialists, and Cooks was to identify all men in Mental Group IV and determine the amount of time they had worked in the particular specialty. Generally, all Mental Group IV men available were used as test subjects. For each man in Mental Group IV, a matching man was selected at random from the available pool of Mental Group I-III men with the same amount of job experience.

Exceptions to this procedure had to be adopted in the selection of Armor Crewmen in USAREUR and Cooks at Fort Ord. In order to maximize the number of men in the sample with longer time on the job, all Armor Crewmen in Mental Group IV with more than one year of job experience were utilized. These 99 men were matched with men from Mental Group I-III selected at random from the available pool of men with the same amount of job experience. All of these men became subjects in the study. Since 120 pairs of subjects were required in USAREUR, an additional 21 Armor Crewmen from Mental Group IV with less than one year of job experience were randomly selected and then matched at random from a comparable pool of men from Mental Group I-III.

At Fort Ord there were more Cooks available in Mental Group IV than in Mental Group I-III. This made a reversal of the selection process necessary. All Cooks in Mental Group I-III were used and were matched with Cooks from Mental Group IV selected at random from the pool of men with the same amount of job experience.

The selection of Medical Specialists for testing presented a variety of difficulties that dictated departures from the general matching procedure. When sample selection was begun, it was determined that a sufficient number of Medical Specialists in Mental Group IV were not available at the relatively small number of installations that could reasonably be visited during the data collection phase. Thus it was necessary to reduce the size of the sample selected for testing in this MOS. Ultimately, it was necessary to set up testing at 14 different hospitals in order to obtain even a reduced number of subjects.

Medical Specialists work in a wide variety of duty positions ranging from direct patient care assignments such as in wards, clinics, emergency treatment rooms, dispensaries, and ambulance units, to MOS-nonrelated support activities such as working in

[13] Armor Crewmen who are First Sergeants generally perform in administrative jobs rather than as members of tank crews. Armor Crewmen in Headquarters companies perform as members of tank crews less frequently than do men in Line companies. Repairmen who work as parts clerks generally spend no time in the actual repair of vehicles. Company Armorers typically do not work in supply rooms nor perform the duties of the Supply Specialist. Supply personnel working in S&T Battalions perform a very restricted number of specialized jobs.

[14] Following a procedure obtained from the Behavior and Systems Research Laboratory (BESRL), the arithmetic average of VE, AR, SM, and PA was obtained. This average, expressed in Army Standard Score Form, was converted to an estimated AFQT score by means of a conversion table supplied by BESRL.

motor pools, transportation units, and varied company assignments. This extreme job diversity further complicated the problem posed by the small number of available subjects.

In the other MOSs studied, all job incumbents performed essentially the same job duties, duties that could be represented in the job sample test. The test for the Medical Specialist had been developed to measure job performance of men in direct patient care assignments. While Medical Specialists who worked in other assignments, such as medical records processing, Central medical supply, and physical examination stations, were included in the sample, their actual job duties were not reflected in the job sample test. Indeed, all Medical Specialists at each hospital where testing occurred were included regardless of their specific job duties. Matching in this MOS, therefore, took account of duty assignments, as well as time on the job. Subjects in Mental Group IV who worked in direct patient care assignments were matched with men in Mental Group I-III who also worked in direct patient care assignments. Similarly, matching occurred within the following types of assignments: MOS-related jobs with some patient contact, MOS-related jobs with no patient contact, and MOS-nonrelated support activities.

In selecting and matching Medical Specialists, the initial steps were taken before going to hospitals where testing occurred. The permanent military records of all Medical Specialists at major Army Hospitals in the continental United States were examined to determine the number of men in Mental Group IV and Mental Groups I-III at each hospital. Those hospitals that could provide a fairly large number of test subjects were asked to set dates for testing. Tentative matches for time on the job and duty assignment were made prior to testing. When the data collection phase was completed, final pairings were made based on time on the job and duty position as stated by each subject. In order to utilize the test data of as many subjects as possible, final matching was made across hospitals rather than for subjects working within one hospital.

For all MOSs, the matching tolerances used to pair subjects are given in Table 2. Although relatively few in number, the sample included men in each MOS with up to 20 years of job experience.

Table 2

**Tolerances in Matching Pairs**

| Time in Job | Tolerances |
|---|---|
| 1- 6 months | ± 1 month |
| 7-12 months | ± 2 months |
| 1- 6 years | ± 3 months |
| 7-10 years | ± 9 months |
| 11-15 years | ± 34 months |
| Above 16 years | ± 38 months |

## TESTING SEQUENCE

Testing in all MOSs was conducted for each subject in a two-day cycle. Each man began one day's test by filling out a questionnaire in which he described his typical daily job duties. Following this, he took a written test of job knowledge and the job sample test. On the other day, each man began by completing the biographical questionnaire and checklist, and was then administered the paper-and-pencil test instruments. The procedure was staggered so that approximately half the subjects began the testing cycle with the job

duties questionnaire and half with the biographical questionnaire. Each individual test instrument took from 30 minutes to one hour to complete except for the job sample test which, depending on the MOS involved, took from three to five hours.

Data from each man's permanent record were collected prior to testing. Supervisor's evaluations and their descriptions of the subject's job duties were obtained during the test cycle.

## CHRONOLOGY OF DEVELOPMENT AND DATA COLLECTION

Work Unit UTILITY was initiated in January 1967 with preliminary studies at Fort Ord and Camp Roberts of the relationship between background and personal characteristics and job success among lower aptitude men. At the same time, a search was begun for instruments that measure intellective and noncognitive attributes that might be predictive of success among lower aptitude individuals.

In May 1967 the MOSs to be included in the study were selected. In July 1967 work began on the development of job sample and job knowledge tests that would be used to assess performance. Senior enlisted men were assigned on a temporary duty basis to HumRRO Division No. 3 to assist in the development of these tests. Test development for Armor Crewman, Repairman, Supply Specialist, and Cook was completed in December 1967.

A formal pilot study was scheduled at Fort Hood, Texas, for December 1967. Because of delays in funding, assignment of enlisted men as test administrators, and authority for the pilot testing, the study was postponed until January 1968. In January plans for the pilot test were canceled because funds had not been received nor had enlisted men been assigned to assist in the testing, and because other troop commitments at Fort Hood made it doubtful that enough men would be available for testing.

A formal pilot study had been considered highly desirable for the refinement of all tests and to determine the value of experimental noncognitive tests. The inability to conduct pilot tests made it necessary to drop several of the experimental tests that were comparatively expensive in terms of administration time since their cost/effectiveness for the research objectives could not be evaluated. While some informal trials of instruments had been carried out during the developmental stage, and some testing materials had been adapted from tests used under other circumstances, the tests retained for use in this program were in an essentially untested condition.

In April 1968 permission to initiate data collection using troops assigned to the U.S. Army, Europe (USAREUR) was requested but was not granted due to troop commitments already made. In May 1968 a staff member of Work Unit UTILITY visited USAREUR in an attempt to find a way to schedule data collection there, but making the necessary arrangements proved to be impossible.

In June 1968 staff members of Work Unit UTILITY visited the 1st and 2nd Armored Divisions at Fort Hood and determined that a sufficient number of men in Mental Group IV would be available there to undertake testing. Data collection for a portion of the required sample was begun in July and concluded in September 1968. These data were collected for all MOSs except Medical Specialists. The remainder of the data for Cooks was collected at Fort Ord during September and October 1968.

In September 1968 arrangements were made to continue data collection in the 5th Infantry Division (Mechanized) at Fort Carson. This phase was subsequently postponed to early 1969 because of troop commitments.

Also in September 1968, explorations were begun at the suggestion of the Chief of Staff, U.S. Army, to determine whether data collection would be possible in Korea. It was determined that this would not be feasible since the specific tank, the M60A1, needed for testing Armor Crewman and Repairman was not used in Korea.

Data collection for three MOSs, Armor Crewman, Repairman, and Supply Specialist, was begun at Fort Carson in January 1969 and concluded at the end of February. This phase fulfilled the requirement for the Repairman sample.

Data collection for the Medical Specialist was started during January and February 1969, with testing at Forts Polk, Benning, Jackson, and Dix. Data collection in this MOS continued during April-June 1969 at hospitals located at Fort Ord and the Presidio of San Francisco; Fort Carson; Fort Sill, Oklahoma; Fort Leonard Wood, Missouri; Fort Knox, Kentucky; Fort Meade, Maryland; Fort Monmouth, New Jersey; Fort Bragg, North Carolina; and Fort Gordon, Georgia. Testing in this MOS was then terminated.

The remainder of the data for Armor Crewmen and Supply Specialist was gathered in the 1th Armored Division and VII Corps, USAREUR, during April-June 1969.

Table 3

**Number of Men Tested in the Armor Crewman, Repairman, Supply Specialist, and Cook MOSs**

| Location | Armor Crewman (11E) | Repairman (63C) | Supply Specialist (76Y) | Cook (94B) |
|---|---|---|---|---|
| 1st Armored Division | 28 | 64 | 56 | 66 |
| 2nd Armored Division | 62 | 108 | 90 | 100 |
| 5th Infantry Division (M) | 52 | 224 | 114 | — |
| 4th Armored Division | 242 | — | 150[a] | — |
| Fort Ord | — | — | — | 214 |
| Total | 384 | 396 | 410 | 380 |

[a]Five of the subjects in this MOS were assigned to VII Corps.

Table 4

**Number of Men Tested in the Medical Specialist MOS (91B)**

| Location | Hospital | Number |
|---|---|---|
| Fort Benning, Georgia | Martin Army Hospital | 37 |
| Fort Bragg, North Carolina | Womack Army Hospital | 14 |
| Fort Carson, Colorado | U.S. Army Hospital | 15 |
| Fort Dix, New Jersey | U.S. Walson Army Hospital | 41 |
| Fort Gordon, Georgia | U.S. Army Hospital | 19 |
| Fort Jackson, Mississippi | U.S. Army Hospital | 9 |
| Fort Knox, Kentucky | U.S. Ireland Army Hospital | 13 |
| Fort Leonard Wood, Missouri | U.S. General Leonard Wood Army Hospital | 11 |
| Fort Meade, Maryland | U.S. Kimbrough Army Hospital | 31 |
| Fort Monmouth, New Jersey | U.S. Patterson Army Hospital | 14 |
| Fort Ord, California | U.S. Army Hospital | 17 |
| Fort Polk, Louisiana | U.S. Army Hospital | 25 |
| Fort Sill, Oklahoma | U.S. Reynold Army Hospital | 13 |
| Presidio of San Francisco, California | Letterman General Hospital | 7 |
| Total | | 266 |

## FINAL COMPOSITION OF THE SAMPLE

The total number of men tested at each of the locations where testing occurred is shown in Table 3 for Armor Crewman, Repairman, Supply Specialist, and Cook. At each location the sample was made up of matched pairs (e.g., the 28 Armor Crewmen tested at the 1st Armored Division constituted 14 matched pairs).

The total number of Medical Specialists tested at each of the hospitals is shown in Table 4; for this MOS pairs were matched across locations at the completion of testing.

The total number of subjects in the study was 1836. The number reported varies somewhat from table to table. Tables presenting some of the data on personal characteristics vary since not all of the military records and source documents were complete (for example, some aptitude test scores were missing).

## BACKGROUND AND PERSONAL CHARACTERISTICS OF THE SAMPLE

A more detailed presentation of the characteristics of the subjects will be provided in a later report in this series dealing with the personal and background attributes of effective and ineffective performers. The features reported here are the more obvious characteristics associated with different MOS and AFQT groupings. The primary intention in this report is to present descriptive data about the sample in general. Where differences between different portions of the sample are noted, no statistical tests of significance of these differences have been carried out. The nature of the study did not permit controlling the number of cases that appear at any given level of AFQT or between MOSs. A marked disproportionality will, therefore, be observed between corresponding numbers of cases in various tables. Any analyses of significance of differences that would take this lack of proportionality into account are cumbersome and time consuming, and did not seem warranted for the descriptive purposes of this report.

### PROJECT 100,000 MEN

While the lower aptitude sample could not be restricted to men who had been accepted into the Army as part of Project 100,000, some men who entered the Army under this program were present in the sample. Table 5 shows the number and percentage of Project 100,000 men in the sample of Mental Group IV subjects.

Table 5

**Number and Percentage of Project 100,000 Men in Mental Category IV**

| MOS | Total *N*, Mental Category IV Subjects | Total *N*, Project 100,000 Subjects | Percentage, Project 100,000 Subjects |
|---|---|---|---|
| Armor Crewman (11E) | 192 | 27 | 14 |
| Repairman (63C) | 198 | 18 | 9 |
| Supply Specialist (76Y) | 205 | 28 | 14 |
| Medical Specialist (91B) | 130 | 18 | 14 |
| Cook (94B) | 190 | 48 | 25 |
| Total Sample | 915 | 139 | 15.2 |

## RACE AND SOCIAL STATUS

Men at the lower end of the aptitude range are more likely to come from lower socioeconomic levels and to represent underprivileged or less culturally advantaged segments of the population. Overall, for example, 30% of the men with AFQT scores between 0 and 30 (Mental Groups IV and V) were Negro, whereas only 7% of the men with AFQT scores between 31 and 99 (Mental Groups I, II, and III) were Negro. The percentages of Caucasians, Negroes, and Others (includes American Indians, Mongoloids, and Malaysians) at five levels of AFQT for five MOSs are given in Table 6. The ratio of one race to another is quite similar in each MOS, with fewer Negroes at higher AFQT levels. In each ratio of Negroes to Caucasians diminishes as AFQT level increases.

The Repairman MOS contains the lowest percentage of Project 100,000 men (Table 5); this MOS also contains the lowest percentage of Negroes (Table 6). While one of the goals of Project 100,000 is to provide lower aptitude and culturally disadvantaged persons with skills they can use when they return to civilian status, the relatively low percentage of Project 100,000 subjects and of Negroes in this MOS suggests that a smaller proportion of such persons may be receiving assignments to this particular job. If so, this would seem particularly unfortunate, since assigning men to the Repairman job is an obvious way to provide military training and work experience that will transfer directly to an important civilian occupation.

Support for the proposition that men at the lower AFQT levels are more likely to come from less culturally advantaged segments of the population is found in the results obtained through the administration of the Environmental Participation Index (EPI),[15] a checklist designed to measure an individual's exposure to common middle-class experiences. The EPI provides a "possessions" score estimating the extent of the material content of the home and an "activities" score estimating the degree of exposure to common activities in middle-class American culture.

Table 7 shows the mean "possessions" and "activities" scores and total score for different AFQT groups. The "possessions" scores can range from 0-20 and the "activities" scores from 0-48. Data for all MOSs have been combined since the average scores for each AFQT level were substantially the same across MOSs. Although the differences are not large, with one exception, mean scores on both parts of the instrument increase as AFQT level increases. Thus, there is a greater likelihood for persons in the higher aptitude groups to have been exposed to more of the materials and experiences common to middle-class American culture.

There is only the slightest evidence that men at the higher AFQT levels tended to hold jobs involving more complex skills and greater responsibility before they came into the Army. The types of pre-Army jobs, ranging from unskilled to professional, for the entire sample and for the different AFQT levels, are shown in Table 8. While the data are descriptive of the sample, extensive interpretation is not warranted. The information is taken from Army Records based on interviews at the time of entry into the Army and therefore is dependent on the concern of the interviewer in obtaining and recording this information. It seems likely that a sizable portion of the sample entered the Army more or less directly from school and had little or no time intervening for finding and working in jobs. There are a large number of men at each AFQT level whose records had no information on pre-Army jobs.

[15] The EPI is described in detail in the second report of this series, "Performance in Five Army Jobs by Men at Different Aptitude (AFQT) Levels: 2. Development and Description of Instruments," HumRRO Technical Report in preparation.

Table 6

**Percentage of Caucasians, Negroes, and Other Races at Five AFQT Levels in Five MOSs[a]**

| MOS | AFQT Level | *N* | Percentage | | |
|---|---|---|---|---|---|
| | | | Caucasians | Negro | Other |
| Armor Crewman (11E) | 0-20 | 98 | 59 | 40 | 1 |
| | 21-30 | 93 | 71 | 28 | 1 |
| | 31-47 | 63 | 92 | 5 | 3 |
| | 48-64 | 65 | 92 | 6 | 2 |
| | 65-99 | 63 | 95 | 3 | 2 |
| | 0-99 | 382 | 79 | 19 | 2 |
| Repairman (63C) | 0-20 | 93 | 76 | 23 | 1 |
| | 21-30 | 102 | 75 | 24 | 1 |
| | 31-47 | 64 | 95 | 5 | — |
| | 48-64 | 74 | 98 | 1 | 1 |
| | 65-99 | 57 | 98 | 2 | — |
| | 0-99 | 390 | 86 | 13 | 1 |
| Supply Specialist (76Y) | 0-20 | 100 | 59 | 41 | — |
| | 21-30 | 98 | 64 | 30 | 6 |
| | 31-47 | 63 | 81 | 19 | — |
| | 48-64 | 59 | 90 | 8 | 2 |
| | 65-99 | 76 | 96 | 4 | 0 |
| | 0-99 | 396 | 75 | 23 | 2 |
| Medical Specialist (91B) | 0-20 | 44 | 50 | 50 | — |
| | 21-30 | 86 | 52 | 48 | — |
| | 31-47 | 53 | 55 | 43 | 2 |
| | 48-64 | 39 | 79 | 18 | 3 |
| | 65-99 | 38 | 97 | 3 | — |
| | 0-99 | 260 | 63 | 36 | 1 |
| Cook (94B) | 0-20 | 107 | 66 | 31 | 3 |
| | 21-30 | 80 | 75 | 25 | — |
| | 31-47 | 77 | 80 | 17 | 3 |
| | 48-64 | 56 | 94 | 4 | 2 |
| | 65-99 | 54 | 96 | 4 | 0 |
| | 0-99 | 374 | 80 | 19 | 1 |

[a]The AFQT ranges shown in this and subsequent tables refer respectively to: Category V and low Category IV; the higher Category IV; lower Category III: higher Category III; Categories II and I.

## AGE

The average age of the sample was 24.0 years, with the Repairmen and Cooks tending to be younger and the Medical Specialists older (Table 9). As is noted in a succeeding section, the Cook sample contained a disproportionate number of men in their

Table 7

## Mean Environmental Participation Index Scores by AFQT Level

| AFQT Level | *N* | Possessions Score (P) | Activities Score (A) | P plus A Score |
|---|---|---|---|---|
| 0-20 | 442 | 13.6 | 29.6 | 43.2 |
| 21-30 | 464 | 13.4 | 30.2 | 43.6 |
| 31-47 | 319 | 14.0 | 31.7 | 45.7 |
| 48-64 | 296 | 14.8 | 33.0 | 47.8 |
| 65-99 | 291 | 15.4 | 34.6 | 50.0 |

Table 8

## Percentages[a] of Men at Five AFQT Levels in Pre-Army Civilian Jobs

| AFQT Level | *N* in Pre-Army Jobs | Type of Civilian Job (Percent) | | | | | | | *N* of Unknown |
|---|---|---|---|---|---|---|---|---|---|
| | | Un-Skilled | Semi-Skilled | Skilled | Managerial | Technical | Small Business Owner or Self-Employed | Professional | |
| 0-20 | 223 | 14 | 64 | 20 | 2 | — | — | — | 219 |
| 21-30 | 213 | 17 | 63 | 16 | 2 | — | — | 2 | 251 |
| 31-47 | 140 | 12 | 68 | 18 | 2 | — | — | — | 179 |
| 48-64 | 124 | 13 | 60 | 20 | 4 | 2 | 1 | — | 172 |
| 65-99 | 112 | 11 | 58 | 22 | 1 | 4 | 1 | 3 | 179 |
| Total | 812 | 14 | 63 | 19 | 2 | 1 | — | 1 | 1000 |

[a]Percentages do not include the 1000 men in the sample who either did not hold pre-Army jobs or whose records were incomplete.

Table 9

## Mean Ages, by MOS

| MOS | *N* | Mean Age |
|---|---|---|
| Armor Crewman (11E) | 382 | 24.0 |
| Repairman (63C) | 390 | 22.8 |
| Supply Specialist (76Y) | 398 | 24.8 |
| Medical Specialist (91B) | 262 | 26.7 |
| Cook (94B) | 373 | 22.6 |
| Total | 1805 | 24.0 |

first military tour, whereas the Repairmen category tended to have fewer men with long military experience. The latter suggests that Repairmen, who possess skills that provide good civilian job opportunities, may tend to leave the Army more readily. The Medical Specialists, on the other hand, have the longest average time in the Army (see below), which is also related to their older ages. It is likely that the civilian jobs for which they qualify, such as hospital orderly and nurse's aide, are less attractive since the salaries and the status are low. Also, such jobs as nurse's aide may suffer from the additional stigma that historically they have been held by women.

Table 10

**Percentage of Men in Three Levels of Schooling for Five AFQT Levels and Five MOSs**

| MOS | AFQT Level | *N* | Level of Schooling (Percent) | | |
|---|---|---|---|---|---|
| | | | Less Than 12 Years | 12 Years | More Than 12 Years |
| Armor Crewman (11E) | 0-20 | 97 | 52 | 40 | 8 |
| | 21-30 | 93 | 40 | 53 | 7 |
| | 31-47 | 61 | 43 | 52 | 5 |
| | 48-64 | 64 | 39 | 50 | 11 |
| | 65-99 | 63 | 19 | 56 | 25 |
| | 0-99 | 378 | 40 | 49 | 11 |
| Repairman (63C) | 0-20 | 91 | 51 | 45 | 4 |
| | 21-30 | 104 | 49 | 45 | 6 |
| | 31-47 | 65 | 41 | 51 | 8 |
| | 48-64 | 74 | 39 | 50 | 11 |
| | 65-99 | 57 | 21 | 60 | 19 |
| | 0-99 | 391 | 42 | 49 | 9 |
| Supply Specialist (76Y) | 0-20 | 100 | 39 | 49 | 12 |
| | 21-30 | 99 | 29 | 57 | 14 |
| | 31-47 | 62 | 29 | 61 | 10 |
| | 48-64 | 59 | 19 | 66 | 15 |
| | 65-99 | 78 | 13 | 42 | 45 |
| | 0-99 | 398 | 27 | 54 | 19 |
| Medical Specialist (91B) | 0-20 | 44 | 20 | 71 | 9 |
| | 21-30 | 85 | 46 | 52 | 2 |
| | 31-47 | 51 | 31 | 53 | 16 |
| | 48-64 | 40 | 25 | 53 | 22 |
| | 65-99 | 39 | 3 | 61 | 36 |
| | 0-99 | 259 | 29 | 57 | 14 |
| Cook (94B) | 0-20 | 107 | 42 | 45 | 13 |
| | 21-30 | 81 | 56 | 38 | 6 |
| | 31-47 | 76 | 41 | 50 | 9 |
| | 48-64 | 58 | 24 | 62 | 14 |
| | 65-99 | 53 | 17 | 57 | 26 |
| | 0-99 | 375 | 38 | 49 | 13 |

## EDUCATION

The number of years of school that a man has completed is highly related to his AFQT score (Table 10). In all MOSs, the percentage of men who drop out of school before the 12th grade tends to decrease as AFQT score increases and the percentage of men who complete 12 or more years of school generally increases as AFQT increases. Armor Crewmen, Repairmen, and Cooks have poorer educational records. In these MOSs, between 38% and 42% have dropped out of school before the 12th grade and only 9% to 13% have attended school beyond the 12th grade.

While these three MOSs have identical percentages of men completing high school, 49%, the Supply and Medical Specialists have 54% and 57%, respectively. That the Supply Specialists have better educational records is also seen in the 19% who have gone beyond high school. The higher-level educational patterns of the Medical and Supply Specialists are perhaps slightly related to the higher average age of these groups (see below).

## MARITAL STATUS

No relationship between AFQT score and marital status was evident in the sample. The highest percentage of single men was found among Cooks (Table 11). Again, this may be related to age.

Table 11

**Marital Status of Men, by MOS**

*(Percent)*

| MOS | *N* | Single | Married | Other[a] |
|---|---|---|---|---|
| Armor Crewman (11E) | 382 | 54 | 43 | 3 |
| Repairman (63C) | 392 | 50 | 47 | 3 |
| Supply Specialist (76Y) | 398 | 45 | 52 | 3 |
| Medical Specialist (91B) | 261 | 45 | 49 | 6 |
| Cook (94B) | 373 | 59 | 37 | 4 |

[a]Divorced, separated, or widowed.

## ARMY CLASSIFICATION BATTERY/ ARMY QUALIFICATION BATTERY SCORES

AFQT scores are highly related to all Aptitude Test scores and Aptitude Area scores derived from them. While this is not unexpected for those aptitude tests that comprise the AFQT—namely Verbal, Arithmetic Reasoning, Shop Mechanics, and Pattern Analysis—the consistency of the relationship between AFQT score and Aptitude Test score on tests which do and do not contribute to AFQT is nevertheless quite striking. Tables 12 through 16 display mean Aptitude Test and Aptitude Area scores for five AFQT levels in each of the MOSs. In the four tests contributing to AFQT, there are no instances among 80 comparisons where mean scores fail to exceed those of the preceding lower AFQT level. In the remaining tests, which do not contribute to AFQT, there are only 12 instances among 140 comparisons where mean scores fail to exceed those of the preceding lower AFQT level. Among these 12 instances, there were eight inversions and four ties.

Table 12

## Mean Scores in Army Aptitude Tests and Army Aptitude Areas[a]: Armor Crewman (11E)

| Test/Area | AFQT Level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-20 | | 21-30 | | 31-47 | | 48-64 | | 65-99 | | 0-99 | |
| | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score |
| Aptitude Test | | | | | | | | | | | | |
| Verbal | 97 | 79 | 93 | 88 | 59 | 98 | 62 | 105 | 62 | 115 | 373 | 95 |
| Arithmetic Reasoning | 97 | 77 | 94 | 86 | 60 | 94 | 62 | 99 | 62 | 114 | 375 | 92 |
| Shop Mechanics | 97 | 88 | 94 | 95 | 60 | 101 | 61 | 109 | 62 | 112 | 374 | 99 |
| Pattern Analysis | 97 | 80 | 94 | 85 | 60 | 95 | 61 | 102 | 62 | 117 | 374 | 93 |
| Army Clerical Speed | 97 | 95 | 94 | 96 | 60 | 101 | 61 | 101 | 62 | 111 | 374 | 100 |
| Automotive Information | 97 | 95 | 94 | 97 | 60 | 102 | 61 | 112 | 62 | 113 | 374 | 102 |
| Mechanical Aptitude | 97 | 87 | 94 | 91 | 60 | 102 | 61 | 110 | 62 | 116 | 374 | 99 |
| Electronics Information | 95 | 87 | 88 | 93 | 56 | 100 | 60 | 107 | 60 | 113 | 359 | 98 |
| General Information | 85 | 87 | 75 | 93 | 52 | 100 | 53 | 107 | 57 | 113 | 322 | 98 |
| Classification Inventory | 85 | 86 | 75 | 94 | 52 | 89 | 53 | 94 | 56 | 103 | 321 | 93 |
| Army Radio Code | 83 | 77 | 68 | 88 | 48 | 96 | 50 | 96 | 53 | 113 | 302 | 92 |
| Aptitude Area | | | | | | | | | | | | |
| Infantry | 85 | 84 | 75 | 92 | 55 | 92 | 54 | 97 | 57 | 107 | 326 | 93 |
| Armor-Artillery-Engineer | 85 | 91 | 75 | 94 | 55 | 101 | 54 | 110 | 57 | 113 | 326 | 101 |
| Electronics | 93 | 87 | 86 | 93 | 61 | 100 | 62 | 108 | 61 | 114 | 363 | 99 |
| General Maintenance | 97 | 85 | 94 | 91 | 63 | 99 | 65 | 107 | 63 | 113 | 382 | 97 |
| Motor Maintenance | 97 | 92 | 94 | 95 | 63 | 101 | 65 | 109 | 63 | 114 | 382 | 101 |
| General Technical | 97 | 78 | 94 | 87 | 63 | 95 | 65 | 102 | 63 | 115 | 382 | 93 |
| Radio Code | 84 | 78 | 66 | 89 | 47 | 99 | 52 | 101 | 54 | 114 | 303 | 94 |
| Clerical | 97 | 88 | 94 | 93 | 63 | 99 | 65 | 103 | 63 | 113 | 382 | 98 |

[a]Army Classification Battery and Army Qualification Battery; all scores are in the Army Standard Score System, mean=100, standard deviation=20.

Table 13

## Mean Scores in Army Aptitude Tests and Army Aptitude Areas[a]: Repairman (63C)

| Test/Area | AFQT Level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-20 | | 21-30 | | 31-47 | | 48-64 | | 65-99 | | 0-99 | |
| | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score |
| Aptitude Test | | | | | | | | | | | | |
| Verbal | 91 | 77 | 101 | 85 | 64 | 97 | 73 | 102 | 56 | 113 | 385 | 92 |
| Arithmetic Reasoning | 91 | 73 | 102 | 82 | 64 | 91 | 73 | 101 | 56 | 115 | 386 | 90 |
| Shop Mechanics | 91 | 97 | 102 | 102 | 64 | 107 | 73 | 110 | 56 | 118 | 386 | 105 |
| Pattern Analysis | 91 | 82 | 102 | 86 | 64 | 93 | 73 | 107 | 56 | 118 | 386 | 95 |
| Army Clerical Speed | 91 | 93 | 102 | 95 | 64 | 102 | 73 | 104 | 56 | 111 | 386 | 100 |
| Automotive Information | 91 | 102 | 102 | 105 | 64 | 115 | 73 | 120 | 56 | 124 | 386 | 112 |
| Mechanical Aptitude | 91 | 96 | 102 | 98 | 64 | 103 | 73 | 109 | 56 | 119 | 386 | 104 |
| Electronics Information | 88 | 93 | 98 | 95 | 63 | 103 | 69 | 110 | 56 | 117 | 374 | 102 |
| General Information | 85 | 83 | 93 | 94 | 60 | 97 | 70 | 102 | 52 | 111 | 360 | 96 |
| Classification Inventory | 84 | 87 | 93 | 90 | 59 | 92 | 70 | 94 | 52 | 100 | 358 | 92 |
| Army Radio Code | 85 | 78 | 90 | 81 | 55 | 95 | 69 | 101 | 54 | 109 | 353 | 90 |
| Aptitude Area | | | | | | | | | | | | |
| Infantry | 86 | 82 | 94 | 87 | 59 | 91 | 71 | 97 | 53 | 105 | 363 | 91 |
| Armor-Artillery-Engineer | 86 | 94 | 94 | 100 | 59 | 107 | 71 | 112 | 53 | 117 | 363 | 104 |
| Electronics | 88 | 94 | 100 | 96 | 63 | 103 | 72 | 110 | 57 | 117 | 380 | 102 |
| General Maintenance | 92 | 92 | 104 | 96 | 65 | 104 | 74 | 110 | 57 | 118 | 392 | 102 |
| Motor Maintenance | 92 | 101 | 104 | 103 | 65 | 111 | 74 | 117 | 57 | 122 | 392 | 109 |
| General Technical | 92 | 75 | 104 | 84 | 65 | 94 | 74 | 102 | 57 | 114 | 392 | 91 |
| Radio Code | 84 | 77 | 89 | 84 | 55 | 96 | 66 | 102 | 54 | 112 | 348 | 92 |
| Clerical | 92 | 85 | 104 | 90 | 65 | 99 | 74 | 104 | 57 | 113 | 392 | 96 |

[a]Army Classification Battery and Army Qualification Battery; all scores are in the Army Standard Score System, mean=100, standard deviation=20.

Table 14

## Mean Scores in Army Aptitude Tests and Army Aptitude Areas[a]: Supply Specialist (76Y)

| Test/Area | AFQT Level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-20 | | 21-30 | | 31-47 | | 48-64 | | 65-99 | | 0-99 | |
| | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score |
| Aptitude Test | | | | | | | | | | | | |
| Verbal | 96 | 85 | 96 | 90 | 62 | 100 | 58 | 108 | 76 | 121 | 388 | 99 |
| Arithmetic Reasoning | 96 | 77 | 96 | 86 | 62 | 101 | 59 | 105 | 76 | 117 | 389 | 95 |
| Shop Mechanics | 96 | 84 | 96 | 91 | 62 | 96 | 59 | 100 | 76 | 114 | 389 | 96 |
| Pattern Analysis | 96 | 77 | 96 | 89 | 62 | 100 | 59 | 106 | 76 | 118 | 389 | 96 |
| Army Clerical Speed | 95 | 101 | 96 | 107 | 62 | 102 | 59 | 109 | 75 | 115 | 387 | 106 |
| Automotive Information | 96 | 85 | 95 | 92 | 62 | 96 | 59 | 105 | 76 | 109 | 388 | 96 |
| Mechanical Aptitude | 96 | 85 | 96 | 91 | 62 | 97 | 59 | 102 | 76 | 114 | 389 | 97 |
| Electronics Information | 92 | 86 | 92 | 90 | 60 | 95 | 59 | 107 | 76 | 110 | 379 | 97 |
| General Information | 85 | 83 | 78 | 90 | 50 | 91 | 51 | 101 | 67 | 112 | 331 | 94 |
| Classification Inventory | 85 | 83 | 78 | 93 | 50 | 91 | 52 | 93 | 67 | 102 | 332 | 92 |
| Army Radio Code | 86 | 77 | 75 | 90 | 46 | 99 | 52 | 106 | 71 | 111 | 330 | 95 |
| Aptitude Area | | | | | | | | | | | | |
| Infantry | 86 | 81 | 80 | 90 | 50 | 94 | 51 | 99 | 70 | 107 | 337 | 93 |
| Armor-Artillery-Engineer | 86 | 84 | 81 | 91 | 50 | 93 | 51 | 103 | 70 | 111 | 338 | 96 |
| Electronics | 94 | 86 | 88 | 89 | 58 | 96 | 57 | 105 | 77 | 112 | 374 | 96 |
| General Maintenance | 100 | 82 | 99 | 90 | 62 | 98 | 59 | 102 | 78 | 116 | 398 | 96 |
| Motor Maintenance | 99 | 84 | 99 | 91 | 62 | 96 | 59 | 103 | 77 | 110 | 396 | 96 |
| General Technical | 99 | 82 | 99 | 89 | 62 | 100 | 59 | 106 | 78 | 119 | 397 | 97 |
| Radio Code | 84 | 82 | 75 | 91 | 47 | 101 | 52 | 107 | 71 | 117 | 329 | 98 |
| Clerical | 99 | 92 | 99 | 98 | 62 | 101 | 59 | 108 | 77 | 118 | 396 | 103 |

[a]Army Classification Battery and Army Qualification Ba tery; all scores are in the Army Standard Score System, mean=100, standard deviation=20.

Table 15

## Mean Scores in Army Aptitude Tests and Army Aptitude Areas[a]: Medical Specialist (91B)

| Test/Area | AFQT Level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-20 | | 21-30 | | 31-47 | | 48-64 | | 65-99 | | 0-99 | |
| | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score |
| Aptitude Test | | | | | | | | | | | | |
| Verbal | 45 | 78 | 86 | 92 | 51 | 101 | 40 | 108 | 38 | 123 | 260 | 98 |
| Arithmetic Reasoning | 45 | 78 | 86 | 87 | 51 | 96 | 40 | 105 | 38 | 118 | 260 | 94 |
| Shop Mechanics | 45 | 80 | 86 | 85 | 51 | 93 | 40 | 97 | 38 | 113 | 260 | 92 |
| Pattern Analysis | 45 | 70 | 86 | 81 | 51 | 92 | 40 | 105 | 38 | 122 | 260 | 91 |
| Army Clerical Speed | 45 | 87 | 86 | 94 | 51 | 97 | 40 | 97 | 38 | 112 | 260 | 96 |
| Automotive Information | 45 | 85 | 86 | 88 | 51 | 89 | 39 | 96 | 38 | 117 | 259 | 93 |
| Mechanical Aptitude | 45 | 85 | 86 | 87 | 51 | 93 | 40 | 97 | 38 | 117 | 260 | 94 |
| Electronics Information | 41 | 84 | 82 | 91 | 46 | 92 | 36 | 97 | 37 | 115 | 242 | 95 |
| General Information | 33 | 80 | 63 | 88 | 36 | 95 | 29 | 98 | 31 | 115 | 192 | 94 |
| Classification Inventory | 33 | 84 | 64 | 95 | 36 | 97 | 29 | 85 | 31 | 100 | 193 | 93 |
| Army Radio Code | 35 | 73 | 60 | 86 | 35 | 93 | 30 | 102 | 31 | 108 | 191 | 91 |
| Aptitude Area | | | | | | | | | | | | |
| Infantry | 33 | 83 | 64 | 92 | 38 | 98 | 30 | 93 | 32 | 107 | 197 | 94 |
| Armor-Artillery-Engineer | 33 | 83 | 64 | 88 | 38 | 91 | 30 | 98 | 32 | 117 | 197 | 94 |
| Electronics | 41 | 84 | 81 | 90 | 45 | 92 | 32 | 98 | 37 | 116 | 236 | 94 |
| General Maintenance | 45 | 78 | 86 | 84 | 52 | 93 | 40 | 100 | 39 | 116 | 262 | 92 |
| Motor Maintenance | 45 | 86 | 86 | 88 | 52 | 90 | 40 | 97 | 39 | 117 | 262 | 94 |
| General Technical | 45 | 78 | 86 | 90 | 52 | 99 | 39 | 107 | 39 | 120 | 261 | 97 |
| Radio Code | 34 | 76 | 62 | 91 | 35 | 98 | 28 | 107 | 32 | 116 | 191 | 96 |
| Clerical | 45 | 83 | 86 | 92 | 51 | 98 | 40 | 102 | 39 | 116 | 261 | 97 |

[a]Army Classification Battery and Army Qualification Battery; all scores are in the Army Standard Score System, mean=100, standard deviation=20.

Table 16

## Mean Scores in Army Aptitude Tests and Army Aptitude Areas[a]: Cook (94B)

| Test/Area | AFQT Level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-20 | | 21-30 | | 31-47 | | 48-64 | | 65-99 | | 0-99 | |
| | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score | *N* | Score |
| Aptitude Test | | | | | | | | | | | | |
| Verbal | 107 | 78 | 79 | 86 | 76 | 96 | 56 | 107 | 54 | 116 | 372 | 93 |
| Arithmetic Reasoning | 108 | 78 | 79 | 87 | 76 | 95 | 56 | 103 | 54 | 114 | 373 | 92 |
| Shop Mechanics | 108 | 83 | 79 | 89 | 76 | 94 | 56 | 105 | 54 | 110 | 373 | 94 |
| Pattern Analysis | 108 | 78 | 78 | 84 | 76 | 92 | 56 | 103 | 54 | 115 | 372 | 91 |
| Army Clerical Speed | 108 | 90 | 79 | 90 | 76 | 93 | 56 | 103 | 54 | 108 | 373 | 95 |
| Automotive Information | 108 | 85 | 79 | 88 | 76 | 92 | 56 | 103 | 54 | 109 | 373 | 93 |
| Mechanical Aptitude | 108 | 84 | 77 | 88 | 76 | 91 | 56 | 103 | 54 | 114 | 371 | 93 |
| Electronics Information | 106 | 82 | 70 | 89 | 75 | 88 | 56 | 100 | 53 | 109 | 360 | 91 |
| General Information | 104 | 76 | 69 | 86 | 66 | 91 | 54 | 102 | 48 | 107 | 341 | 89 |
| Classification Inventory | 104 | 81 | 68 | 81 | 65 | 77 | 53 | 91 | 48 | 91 | 338 | 83 |
| Army Radio Code | 100 | 81 | 67 | 80 | 71 | 87 | 51 | 97 | 51 | 106 | 340 | 88 |
| Aptitude Area | | | | | | | | | | | | |
| Infantry | 104 | 80 | 69 | 84 | 67 | 84 | 55 | 95 | 48 | 99 | 343 | 87 |
| Armor-Artillery-Engineer | 104 | 81 | 70 | 86 | 68 | 92 | 55 | 103 | 48 | 108 | 345 | 92 |
| Electronics | 105 | 82 | 73 | 88 | 71 | 89 | 58 | 102 | 51 | 111 | 358 | 92 |
| General Maintenance | 108 | 82 | 80 | 87 | 76 | 93 | 58 | 105 | 54 | 111 | 376 | 93 |
| Motor Maintenance | 108 | 84 | 80 | 88 | 76 | 92 | 58 | 103 | 54 | 110 | 376 | 93 |
| General Technical | 108 | 79 | 81 | 87 | 76 | 96 | 58 | 105 | 54 | 115 | 377 | 93 |
| Radio Code | 100 | 80 | 62 | 82 | 69 | 93 | 51 | 103 | 50 | 111 | 332 | 91 |
| Clerical | 108 | 85 | 79 | 88 | 76 | 95 | 58 | 105 | 54 | 112 | 375 | 95 |

[a]Army Classification Battery and Army Qualification Battery; all scores are in the Army Standard Score System, mean=100, standard deviation=20.

As might be expected (since these tests are used in the assignment to training for jobs), Repairmen had the highest mean scores on tests measuring mechanical and electronic aptitude (Shop Mechanics, Automotive Information, Mechanical Aptitude, and Electronics Information) and the highest mean scores in related aptitude areas (Armor-Artillery-Engineer, Electronic, General and Motor Maintenance). On the majority of remaining tests and Aptitude Areas, Supply Specialists had the highest mean scores. Medical Specialists tended to have a mixed pattern of scores, closely following the high scores of the Supply Specialists in literacy-related aptitudes such as Verbal Ability and Arithmetic Reasoning, but generally having some of the lowest scores on the tests and areas reflecting mechanical and electronic aptitude. The latter position Medical Specialists shared with Cooks, who, overall, had the lowest Aptitude and Aptitude Area scores.

For Supply Specialists and Cooks, in particular, the general ordering of Aptitude and Aptitude Area scores is closely related to AFQT (Table 17). On the AFQT, Supply Specialists had the highest mean score and Cooks the lowest. The superior score of

Table 17

**Distribution of AFQT Scores, by MOS**

*(Percent)*

| AFQT Level | Armor Crewman (11E) (N=384) | Repairman (63C) (N=392) | Supply Specialist (76Y) (N=398) | Medical Specialist (91B) (N=264) | Cook (94B) (N=378) |
|---|---|---|---|---|---|
| 1- 10 | .5 | 1.8 | 1.3 | 1.5 | 2.6 |
| 11- 20 | 24.8 | 21.7 | 23.6 | 15.2 | 25.9 |
| 21- 30 | 24.8 | 26.5 | 25.1 | 33.3 | 21.4 |
| 31- 40 | 12.2 | 11.0 | 10.8 | 12.1 | 14.8 |
| 41- 50 | 7.8 | 9.4 | 8.3 | 10.2 | 10.1 |
| 51- 60 | 9.4 | 10.7 | 8.8 | 9.5 | 7.4 |
| 61- 70 | 9.9 | 7.7 | 8.8 | 5.7 | 6.9 |
| 71- 80 | 5.2 | 5.6 | 4.5 | 3.8 | 4.8 |
| 81- 90 | 3.6 | 4.6 | 6.3 | 6.1 | 4.2 |
| 91-100 | 1.8 | 1.0 | 2.5 | 2.6 | 1.9 |
| AFQT Mean Score | 38.7 | 38.6 | 39.7 | 38.9 | 37.2 |

Supply Specialists on the battery of Aptitude tests and on the AFQT appears to reflect the higher educational level of this group, as has been reported.

## TIME IN THE ARMY AND TIME ON THE JOB

Distributions of the length of time in the Army for each MOS are shown in Table 18. The sample included men in each MOS with at least 25 years in the Army and 17 years of job experience.

On the average, men in the Medical Specialist sample tended to have been in the Army longer, followed by Supply Specialists, Armor Crewmen, Repairmen, and Cooks. Cumulative distributions of time in the Army for each MOS are shown in Figure 1, with the subsamples of Cooks from Fort Hood and Fort Ord presented separately. Cooks from Fort Ord tended to have the shortest average time in the Army. A large number of men in this group were in their first tour, having been given duty assignments immediately following completion of Advanced Individual Training at Fort Ord.

Distributions of the length of time in the job for each MOS are shown in Table 19 and in cumulative curves with Cooks from Fort Hood and Fort Ord separately in Figure 2. As would be expected, based on their longer time in the Army, Medical Specialists also tended to have been in their jobs longer. They are followed in job longevity by Armor Crewmen and then by Supply Specialists, Cooks, and Repairmen, the latter three MOSs grouped together with essentially the same amounts of time on the job. While the overall ordering of MOSs with respect to time on the job varies somewhat from the order with respect to time in the Army, the only shift of any magnitude is found in the Supply Specialists who had a rather low average time in the job relative to their time in the Army. Additional analyses indicated that many men have moved into the MOS after working in other jobs; this includes some older men, because it is possible to work as a Supplyman with a restricted physical profile. There is also probably a slight trend for some older men to transfer to this MOS because it is an indoor job that is somewhat less physically demanding than most other commonly available Army occupations.

Table 18

## Distribution of Time in Army, by MOS

| Years in Army | Armor Crewman (11E) | Repairman (63C) | Supply Specialist (76Y) | Medical Specialist (91B) | Cook (94B) | All MOSs |
|---|---|---|---|---|---|---|
| 1 | 62 | 108 | 87 | 43 | 181 | 481 |
| 2 | 125 | 85 | 117 | 65 | 119 | 511 |
| 3 | 71 | 132 | 62 | 31 | 18 | 314 |
| 4 | 13 | 4 | 13 | 12 | 3 | 45 |
| 5 | 6 | 9 | 8 | 6 | 3 | 32 |
| 6 | 9 | 8 | 13 | 1 | — | 31 |
| 7 | 8 | 2 | 8 | 5 | 6 | 29 |
| 8 | 11 | 4 | 9 | 3 | 2 | 29 |
| 9 | 1 | 4 | 8 | 4 | 1 | 18 |
| 10 | 8 | 2 | 6 | 6 | 1 | 23 |
| 11 | 12 | 2 | 5 | 5 | 2 | 26 |
| 12 | 6 | — | 1 | 4 | 2 | 13 |
| 13 | 10 | 2 | 3 | 3 | 5 | 23 |
| 14 | 7 | 3 | 2 | 6 | 1 | 19 |
| 15 | 6 | 3 | 8 | 6 | 3 | 26 |
| 16 | 3 | 6 | 4 | 8 | 8 | 29 |
| 17 | 5 | 1 | 12 | 8 | 2 | 28 |
| 18 | 4 | 2 | 2 | 8 | 2 | 18 |
| 19 | 4 | 1 | 4 | 9 | 1 | 19 |
| 20 | 5 | 4 | 10 | 7 | 3 | 29 |
| 21 | 1 | — | 6 | 4 | 1 | 12 |
| 22 | — | 1 | 2 | — | 3 | 6 |
| 23 | 1 | 1 | — | 1 | 1 | 4 |
| 24 | 1 | 1 | 1 | 1 | 1 | 5 |
| 25 | 1 | 1 | 1 | 3 | 1 | 7 |
| 26 | 1 | — | 1 | — | 1 | 3 |
| 27 | — | 1 | 1 | — | 1 | 3 |
| 28 | | — | 2 | 1 | — | 3 |
| 29 | | 1 | — | — | | 1 |
| *N* | 381 | 388 | 396 | 250 | 372 | 1787 |
| Mean Years | 4.5 | 3.2 | 4.8 | 6.6 | 2.8 | 4.2 |

Time in Army

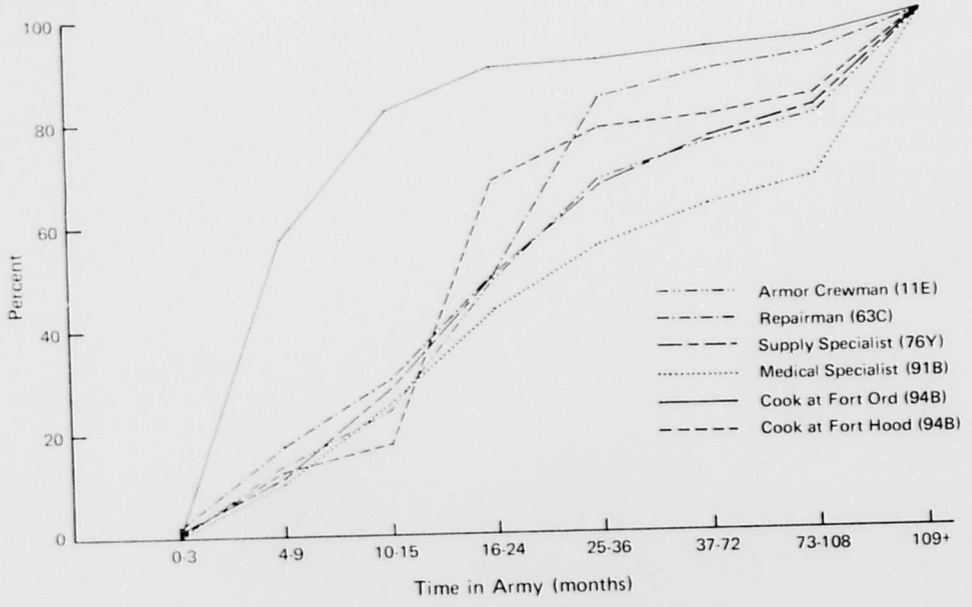


Figure 1

Time in Job

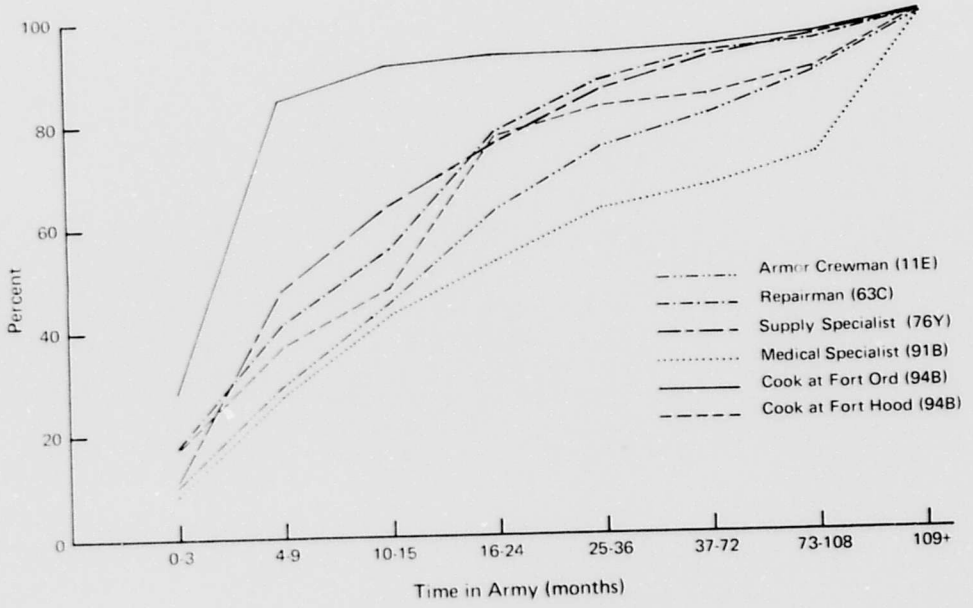


Figure 2

Table 19

## Distribution of Time in Job, by MOS

| Years in Job | Armor Crewman (11E) | Repairman (63C) | Supply Specialist (76Y) | Medical Specialist (91B) | Cook (94B) | All MOSs |
|---|---|---|---|---|---|---|
| 1 | 137 | 183 | 223 | 92 | 257 | 892 |
| 2 | 103 | 127 | 81 | 45 | 70 | 426 |
| 3 | 45 | 40 | 39 | 28 | 10 | 162 |
| 4 | 2 | 4 | 10 | 1 | 3 | 20 |
| 5 | 8 | 3 | 7 | 4 | — | 22 |
| 6 | 16 | 5 | 4 | 4 | 2 | 31 |
| 7 | 12 | 2 | 6 | — | 3 | 23 |
| 8 | 9 | 4 | 8 | 4 | 6 | 31 |
| 9 | 8 | 2 | 3 | 13 | — | 26 |
| 10 | 9 | 2 | 2 | 4 | 2 | 19 |
| 11 | 12 | 6 | — | 7 | 2 | 27 |
| 12 | 4 | 5 | 1 | 5 | 2 | 17 |
| 13 | 3 | 3 | 2 | 13 | 3 | 24 |
| 14 | 3 | 1 | 2 | 7 | 2 | 15 |
| 15 | 3 | 3 | — | 5 | 5 | 16 |
| 16 | 4 | 1 | 2 | 7 | 4 | 18 |
| 17 | 1 | 2 | 1 | 6 | 2 | 12 |
| 18 | 2 | — | 3 | 8 | 2 | 15 |
| 19 | 2 | | 2 | 2 | — | 6 |
| 20 | — | | 2 | 2 | 1 | 5 |
| 21 | | | — | 3 | 3 | 6 |
| 22 | | | — | — | — | — |
| 23 | | | 1 | | — | 1 |
| 24 | | | — | | 1 | 1 |
| 25 | | | | | — | — |
| 26 | | | | | | |
| 27 | | | | | | |
| 28 | | | | | | |
| 29 | | | | | | |
| *N* | 383 | 393 | 399 | 260 | 380 | 1815 |
| Mean Years | 3.2 | 2.0 | 2.1 | 5.2 | 2.1 | 2.7 |

Across all MOSs there is evidence that a proportionately larger number of Negroes tend to remain in the Army. Although 17% of the men with less than three years of service were Negroes, 30% of those with more than three years of service were Negroes. The percentage of Negroes with different lengths of time in the Army and in the job is shown for all MOSs combined in Figures 3 and 4, respectively. After approximately three years in the Army or two years in the job, the representation of Negroes in the sample tends to increase with time.

**Percentage of Negroes in Total Sample at Each Time-in-Army Period**

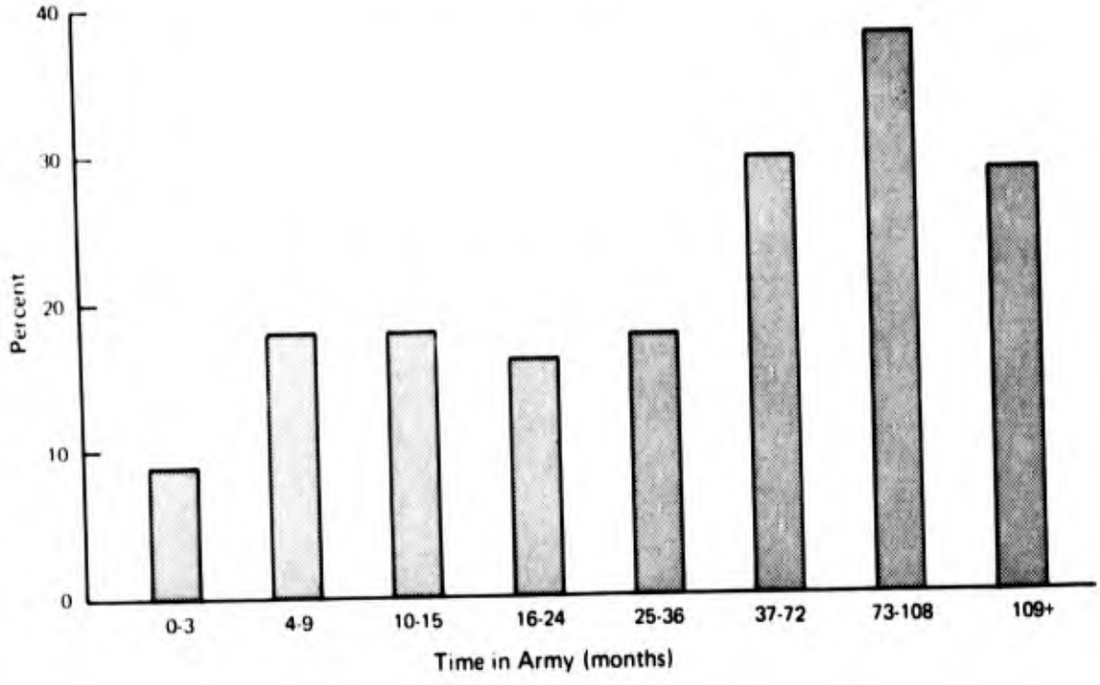


Figure 3

**Percentage of Negroes in Total Sample at Each Time-in-Job Period**

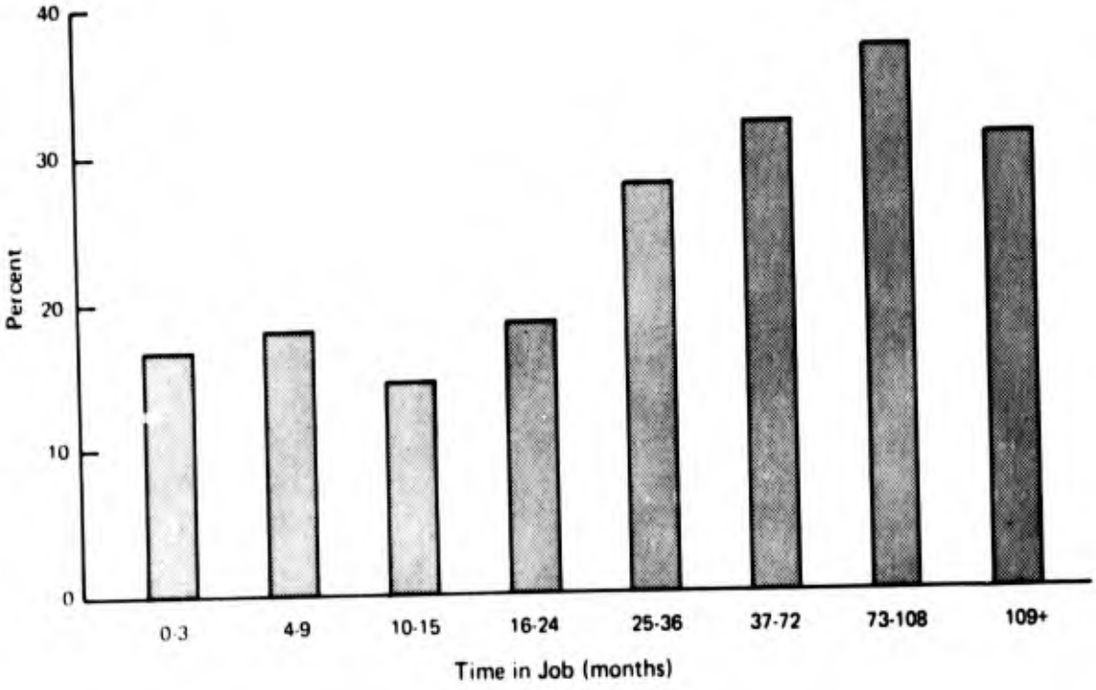


Figure 4

## MILITARY STATUS

Of the total number of subjects in the study, 1,092, or 61%, were Regular Army (RA) and 710, or 39% were draftees (AUS). In four MOSs—Armor Crewman, General Vehicle Repairman, Supply Specialist, and Medical Specialist—the ratio of RA to AUS was almost identical, 64% to 70% RA and 30% to 36% AUS. In the Cook MOS there was a reversal, with 38% RA and 62% AUS (Tables 20 and 21). The higher proportion of AUS men in the Cook sample is, of course, directly related to the greater number of men in this MOS who were in their first military tour at Fort Ord. Across the four highest AFQT levels in the four similar MOSs, the proportion of RA to AUS tends to increase slightly with decreasing AFQT. This is not true for the very lowest AFQT (0-20). Prior to 1 October 1966, men with AFQT scores between 10-15 could not enlist in the Army.

Table 20

**Men in RA and AUS Components for Five AFQT Levels and Four MOSs**

*(Percent)*

| AFQT Level | Armor Crewman (11E) | | Repairman (63C) | | Supply Specialist (76Y) | | Medical Specialist (91B) | | Total All Four MOSs | |
|---|---|---|---|---|---|---|---|---|---|---|
| | RA | AUS | RA | AUS | RA | AUS | RA | AUS | RA | AUS |
| 0-20 | 56 | 44 | 54 | 46 | 53 | 47 | 40 | 60 | 52 | 48 |
| 21-30 | 74 | 26 | 77 | 23 | 68 | 32 | 80 | 20 | 75 | 25 |
| 31-47 | 59 | 41 | 68 | 32 | 73 | 27 | 87 | 13 | 71 | 29 |
| 48-64 | 71 | 29 | 66 | 34 | 76 | 24 | 65 | 35 | 70 | 30 |
| 65-99 | 71 | 29 | 74 | 26 | 59 | 41 | 68 | 32 | 67 | 33 |
| Total | 66 | 34 | 68 | 32 | 64 | 36 | 70 | 30 | 67 | 33 |

Table 21

**Percentage of Men in RA and AUS Components—Five AFQT Levels for Cooks**

| AFQT Level | Cook (94B) | |
|---|---|---|
| | RA (Percent) | AUS (Percent) |
| 0-20 | 31 | 69 |
| 21-30 | 49 | 51 |
| 31-47 | 32 | 68 |
| 48-64 | 33 | 67 |
| 65-99 | 46 | 54 |
| Total | 38 | 62 |

The distribution of military grades is shown in Table 22 by AFQT for the five MOSs and for all MOSs combined. With increasing AFQT there is only the slightest tendency for a decrease in the number of men in the lower grades (1-3) and an increase in the number of men in the upper grades (4-8). The lack of a strong relationship between

Table 22

## Percentage Distribution of Military Grades at Five AFQT Levels, Each MOS and Totals

| MOS | AFQT Levels | *N* | Military Grade (Percent) | | |
|---|---|---|---|---|---|
| | | | 1-3 | 4-6 | 7-8 |
| | | | (*N*=83) | (*N*=283) | (*N*=16) |
| Armor Crewman (11E) | 0-20 | 97 | 27 | 72 | 1 |
| | 21-30 | 94 | 16 | 77 | 7 |
| | 31-47 | 63 | 30 | 67 | 3 |
| | 48-64 | 65 | 20 | 77 | 3 |
| | 65-99 | 63 | 16 | 78 | 6 |
| | 0-99 | 382 | 22 | 74 | 4 |
| | | | (*N*=107) | (*N*=280) | (*N*=5) |
| Repairman (63C) | 0-20 | 92 | 46 | 54 | 0 |
| | 21-30 | 104 | 17 | 82 | 1 |
| | 31-47 | 65 | 26 | 72 | 2 |
| | 48-64 | 74 | 26 | 71 | 4 |
| | 65-99 | 57 | 19 | 79 | 2 |
| | 0-99 | 392 | 27 | 72 | 1 |
| | | | (*N*=85) | (*N*=294) | (*N*=19) |
| Supply Specialist (76Y) | 0-20 | 100 | 31 | 67 | 2 |
| | 21-30 | 99 | 18 | 74 | 8 |
| | 31-47 | 62 | 24 | 69 | 7 |
| | 48-64 | 59 | 14 | 83 | 3 |
| | 65-99 | 78 | 17 | 79 | 4 |
| | 0-99 | 398 | 21 | 74 | 5 |
| | | | (*N*=54) | (*N*=197) | (*N*=11) |
| Medical Specialist (91B) | 0-20 | 45 | 27 | 69 | 4 |
| | 21-30 | 86 | 22 | 74 | 4 |
| | 31-47 | 52 | 13 | 83 | 4 |
| | 48-64 | 40 | 28 | 65 | 7 |
| | 65-99 | 39 | 13 | 85 | 2 |
| | 0-99 | 262 | 21 | 75 | 4 |
| | | | (*N*=180) | (*N*=190) | (*N*=8) |
| Cook (94B) | 0-20 | 108 | 55 | 44 | 1 |
| | 21-30 | 81 | 38 | 59 | 2 |
| | 31-47 | 77 | 60 | 38 | 2 |
| | 48-64 | 58 | 46 | 52 | 2 |
| | 65-99 | 54 | 31 | 65 | 4 |
| | 0-99 | 378 | 48 | 50 | 2 |
| | | | (*N*=509) | (*N*=1244) | (*N*=59) |
| All MOSs Combined | 0-20 | 442 | 39 | 60 | 1 |
| | 21-30 | 464 | 22 | 74 | 4 |
| | 31-47 | 319 | 33 | 64 | 3 |
| | 48-64 | 296 | 27 | 70 | 3 |
| | 65-99 | 291 | 19 | 77 | 4 |
| | 0-99 | 1812 | 28 | 69 | 3 |

AFQT and grade is not unexpected, however, since the primary factor affecting promotions in the Army is the length of time a man has been in service and in the grade he holds.

The percentage of men in each grade is similar for Armor Crewman, Repairman, Supply, and Medical Specialist. Approximately one-quarter of the men fall in grades 1-3 and nearly three-quarters of the men in grades 4-6. The Cook sample is quite different, with approximately half the men in grades 1-3 and half in grades 4-6. This, again, is attributable, at least in part, to greater representation in this MOS of men with less time in the Army.

## SUMMATION

This report, the first in a series on Work Unit UTILITY, has provided the rationale, research design, and chronology of the work in an extensive study in which the objectives were (a) to find out how men in Mental Category IV compared with men in other mental categories in the performance of selected Army jobs, and (b) to identify different factors associated with satisfactory performance in different mental category groupings, exploring the relationships among a man's background, personal characteristics, Army experiences, and job performance.

Information on the general characteristics and job performance of 1836 men with experience ranging up to 20 years in five Army jobs (Armor Crewman, General Vehicle Repairman, Unit and Organizational Supply Specialist, Medical Specialist, and Cook) was collected through a variety of measures, including intensive Job Sample Tests. Information about background, personal characteristics, and military experiences of the men in the sample was obtained through biographical questionnaires, a battery of published and experimental tests, and through Army records, and is briefly summarized in this report.

Other reports in the series will provide descriptions of the instruments used in the study and their development; comparisons of the performance of men in different mental categories with different amounts of job experience; analyses of personal and background characteristics, and of effective and ineffective performance; analyses of the role of literacy variables in performance; and analyses of the interrelationships among different performance criteria.

Unclassified
Security Classification

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13. ABSTRACT

To provide information about the performance and characteristics of effective and ineffective marginal personnel in the Army, a study has been made of approximately 1800 men with experience ranging up to 20 years in five MOSs (11E, Armor Crewman; 63C, General Vehicle Repairman; 76Y, Unit and Organizational Supply Specialist; 91B, Medical Specialist; 94B, Cook). The sample included a comparison group of men in the same jobs but coming from the upper (non-marginal) part of the AFQT distribution. Performance was measured by intensive job sample tests, job knowledge tests, and supervisor ratings. Information about background, personal characteristics, and military experiences was obtained through biographical questionnaires, a battery of published and experimental tests, and Army records. This report, the first in a series, describes the rationale, research design, and general chronology of research events in the study.

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| Learning Ability | | | | | | |
| Marginal Personnel | | | | | | |
| MOS Performance | | | | | | |
| MOS Training | | | | | | |
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