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ABSTRACT

In this assessment of career and occupational development by the National Assessment of Educational Progress (NAEP), work-related skills and knowledge of American adults (aged 26 through 35) are examined. The skills assessed are basic to many employment situations; knowledge about jobs involves both knowledge about facts common to many jobs and knowledge about specific jobs. Skill assessment covers the areas of computation and measurement, graphic and reference-materials, written-communication, and manual and perception. In addition to collecting data on national performance levels, the NAEP analyzes results from various groups within the national population. Chapters 1 and 2 present major findings, and definitions and methodology used in reporting the data. Chapers 3 through 8 provide exemplary exercises and a summary of results for the skills areas and job knowledge assessed. Chapter 9 describes results for variables which were conclusive or similar for the total population. Explanatory tables (24) and figures (32) are provided throughout the document. The appendix shows the mean differences from national performance and the standard error. (WL)

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ED130079

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

ADULT WORK SKILLS AND KNOWLEDGE

Selected Results From the First National Assessment of Career and Occupational Development

Career and Occupational Development Report No. 05-COD-01

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FOREWORD

The National Assessment of Educational Progress (NAEP) is an information-gathering project that surveys the educational attainments of 9-year-olds, 13-year-olds, 17-year-olds and adults (ages 26—35) in 10 learning areas: art, career and occupational development, citizenship, literature, mathematics, music, reading, science, social studies and writing. Different learning areas are assessed every year, and all areas are periodically reassessed in order to measure change in educational achievement.

Each assessment is the product of several years' work by a great many educators, scholars and lay persons from all over the country. Initially, these people design objectives for each area, proposing specific goals that they feel Americans should be achieving in the course of their education. After careful reviews, these objectives are then given to exercise (item) writers, whose task it is to create measurement tools appropriate to the objectives.

When the exercises have passed extensive reviews by subject-matter specialists and measurement experts, they are administered to probability samples from various age levels. The people who comprise these samples are chosen in such a way that the results of their assessment can be generalized for the entire national population. That is, on the basis of the performance of about 2,500 9-year-olds on a given exercise, we can generalize about the probable performance of all 9-year-olds in the nation.

The National Assessment also publishes a general information yearbook that describes all major aspects of the Assessment's operation. The reader who desires more detailed information about how NAEP defines its groups, prepares and scores its exercises, designs its samples and analyzes and reports its results should consult the *General Information Yearbook, Report 03/04-GIY.*

ACKNOWLEDGMENTS

Many people have made substantial contributions to the career and occupational development (COD) assessment, from the beginning of the National Assessment of Educational Progress (NAEP) in 1964 to this first report of findings in the area of career and occupational development. Unfortunately, it is not possible to acknowledge them all here, and an apology is due to those whose names have been omitted.

The preparation of the objectives and exercises in the area of COD was handled by the American Institutes for Research, Palo Alto, California. There, materials were reviewed by dozens of consultants, including educators, employers and interested lay persons, under the general monitoring of the National Assessment staff.

Special mention must be made of several individuals and their contributions to the developmental phases: Marjorie Mastie, formerly of the National Assessment staff, who supervised the development of the COD exercises, and Dr. Ralph Bohn, San Jose (California) State College, who contributed to the development of objectives and exercises and also was extremely helpful in suggesting analysis schemes.

The administration of the career and occupational development assessment was conducted by the Research Triangle Institute, Raleigh, North Carolina, and the Measurement Research Center (MRC), Iowa City, Iowa. Scoring and processing were carried out by MRC and by the NAEP staff. Louise Diana and Susan Worthen of MRC provided invaluable assistance in developing and refining the categories used to score the exercises.

The actual preparation of this report was a collaborative effort of the National Assessment staff. Special thanks must be given to the following people: Bill Ankeny, Hugh Cobb and Charlotte Ramlow, Data Processing Department; Janet Bailey and Ava Powell, Research Assistants, Analysis and Research Department; and Marci Reser and Jessica Grant, Production Assistants, Publications Department. Technical analysis for this report was planned and supervised by Donald Phillips; the report was written by Barbara Ward.

Roy H. Forbes
Project Director

CHAPTER 1

INEQUALITIES IN ACHIEVEMENT – MAJOR FINDINGS

Equal opportunity for all is a goal of American society. Yet in opportunity, as in other things, some Americans are "more equal" than others. In its assessment of career and occupational development (COD), the National Assessment of Educational Progress (NAEP) examined work-related skills and knowledge of American adults ages 26–35. The skills assessed were basic to many employment situations; knowledge about jobs involved both knowledge about factors common to many jobs and knowledge about specific jobs.

In addition to collecting data on national performance levels, National Assessment analyzed results for various groups within the national population. Some of the variables used included levels of an adult's education, family income, type of community lived in, race and sex.

Differences in performance among different groups were often startling and all results pointed to the same conclusion: those who have the least amount of education, the lowest income and the environment with the fewest educational resources are also those who are the most lacking in the skills necessary to improve their condition.

Following are summaries of performance for racial, education, family-income and size-and-type-of-community groups. Results are shown for the highest and lowest performing groups in each variable.

Basic Skills

Basic skills, as defined for the COD assessment, involved more than minimal skills in reading, writing and arithmetic. However, the skills measured did not demand any specialized courses, such as algebra, and virtually all the skills are found within the standard curriculum for grades one through eight. Table 1 gives examples of the types of skills included in the "basic skills" section of this assessment. The average percent correct for the entire nation on these exercises was 73%.

TABLE 1. Samples of Basic Skills Exercises Assessed

Fill out mail order form
Use sales tax table
Write job application letter
Calculate finance charges
Read measuring instruments
Use dictionary and telephone book
Calculate area
Use a map

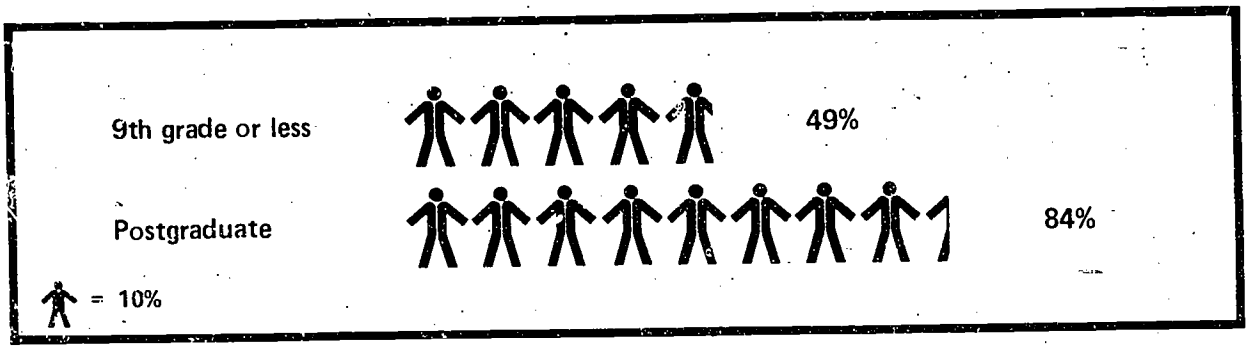
Level of Personal Education

The lowest education category consisted of adults who had a ninth-grade education or less; the highest education category included those adults who had attended graduate school. Figure 1 displays a sizeable difference between these two groups: 35 percentage

points separate their average performance on all basic skills exercises.

Performance of the other education groups (e.g., graduated from high school, completed two to four years of college) was also related to amount of education; as years of school completed increased, average percentages of success on basic skills items increased.

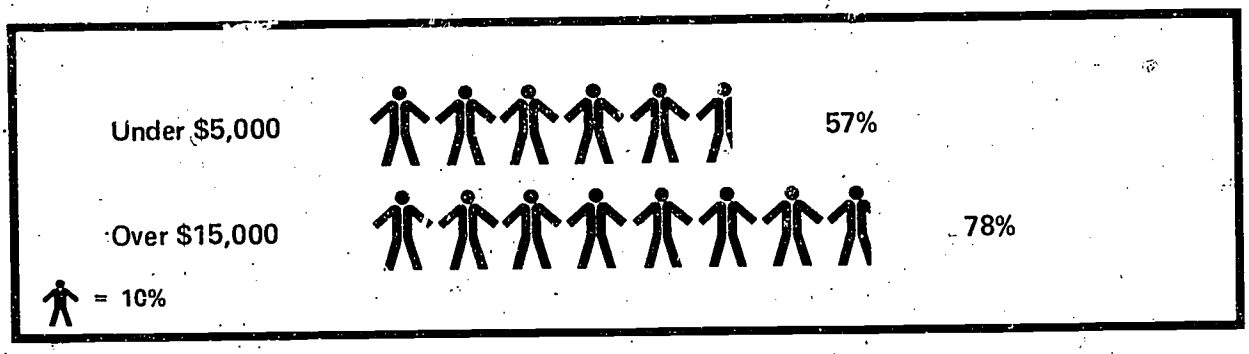
FIGURE 1. Education: Differences in Average Performance on Basic Skills Exercises



Family Income

Persons with an annual family income under $5,000 comprised the lowest family-income group, and persons with an annual family income over $15,000 made up the highest family-income group.[1] Those with family incomes under $5,000 averaged 57% correct on the basic skills items while those with family incomes over $15,000 averaged 78% correct on these items (see Figure 2). Percentages of success increased as family income increased for all the family-income categories surveyed.

FIGURE 2. Family Income: Differences in Average Performance on Basic Skills Exercises



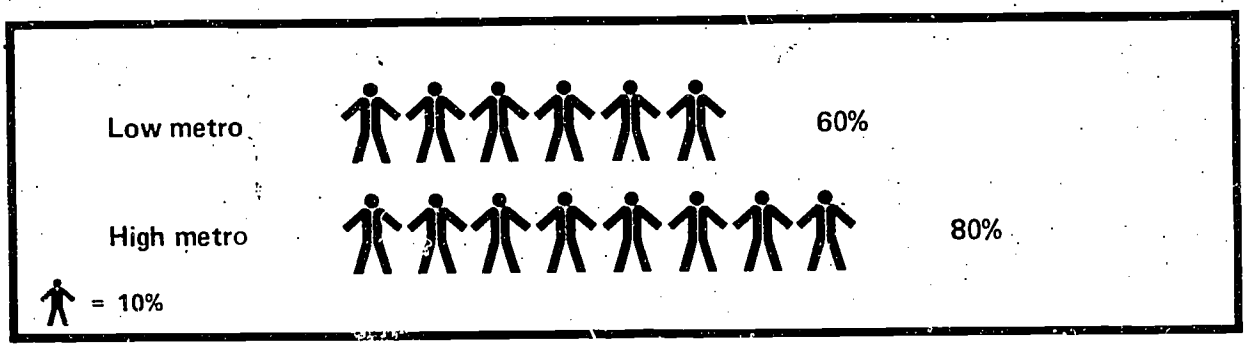
Size and Type of Community

The "low-metropolitan" community group, comprised mainly of residents of inner-city areas with high unemployment and large welfare rolls, performed consistently below the national level. The average percent correct on the basic skills items for the low-metropolitan group was 60%, compared with 73% for the nation. The "high-metropolitan" com-

[1] Incomes are at 1973 levels and have not been adjusted for subsequent inflation.

munity group, comprised mainly of residents of suburban areas with high proportions of professional and managerial workers, performed consistently better than the nation as a whole, showing an average percent correct of 80% on the basic skills items. Figure 3 illustrates the performance of the community-type groups.

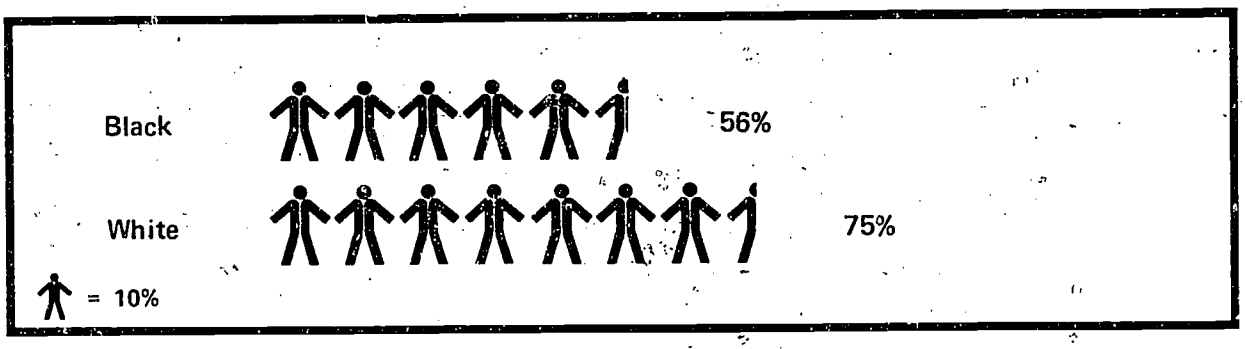
FIGURE 3. Size and Type of Community: Differences in Average Performance on Basic Skills Exercises



Race

Differences in performance also existed between blacks and whites, Nineteen percentage points separated the two groups with an average of 56% of the blacks and 75% of the whites answering the basic skills items correctly (see Figure 4).

FIGURE 4. Race: Differences in Average Performance on Basic Skills Exercises

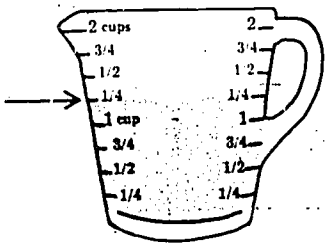


Exemplary Exercises: Basic Skills

The figures shown previously are averages: results were aggregated over a number of items. To give a more complete picture of the assessment, some of the items used as measures of basic skills are shown as follows.

Table 2 presents an item that asked adults to read a measuring instrument. A sizeable portion of the adults, 14%, evidently saw only the "1/4" marking and assumed that 1/4 was the correct answer. The lower achieving groups, however, made this mistake more frequently.

TABLE 2. Sample Exercise and Selected Results: Reading a Measuring Instrument



The measuring cup above is filled with water to the line marked by the arrow. How much water is in the measuring cup?

	National Percentages
¼ cup	14%
1 cup	0*
1¼ cups	85
2¼ cups	0*
I don't know.	0*†

Percentages Correct — Selected Groups

Education		Family Income	
9th grade or less	61%	Under $5,000	60%
Postgraduate	95	Over $15,000	91
Community Type		**Race**	
Low metro	67	Black	58
High metro	95	White	89

**Rounded percents less than one.*
†Figures may not total 100% due to rounding.

Another exercise involved computing a finance charge. This was a somewhat difficult problem since two computational steps were required — multiplying $11.35 x 24 to determine the total amount paid and subtracting $200 from that total to find the finance charge. Approximately two-thirds of the nation's adults answered this problem successfully (see Table 3). However, only about one-third of the low-education and low-income groups found the correct amount.

TABLE 3. Sample Exercise and Selected Results: Computing Finance Charges

Suppose you purchased $200.00 worth of merchandise from a store on an installment plan. You are to make 24 monthly payments of $11.35 each. How much money in finance charges will you have paid at the end of two years?

ANSWER $72.40

National Percentage 66%

Education		Family Income	
9th grade or less	35%	Under $5,000	34%
Postgraduate	84	Over $15,000	78
Community Type		**Race**	
Low metro	43	Black	41
High metro	77	White	70

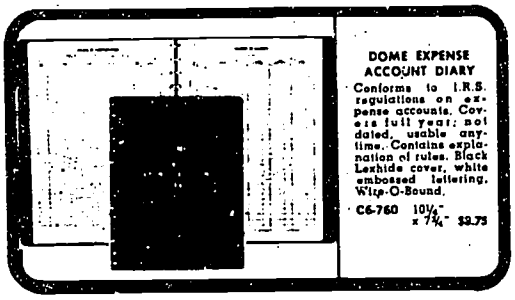
Filling out a mail order form also proved troublesome for the lower performing groups. The various order lines were correctly filled in by 83—84% of the adults; however, only 43—46% of the lowest education group and 55—57% of the blacks did so. This exercise and national percentages of success appear in Table 4.

Substantial differences in performance are apparent on these items, which represent skills essential to successful functioning as a member of our society. The outlook for some segments of the population is not bright. The differences in performance affect not only the individuals in the lower performing groups, although they are the ones most immediately concerned, but also affect the society as a whole, which must bear the cost of welfare and retraining programs.

Job Knowledge

Basic skills in mathematics, in writing and in obtaining information are essential to the job seeker in a competitive labor market. But skills alone are not always sufficient. A person must also have some knowledge about jobs and the world of work. To make rational job

TABLE 4. Sample Exercise and Selected Results: Filling Out a Mail Order Form



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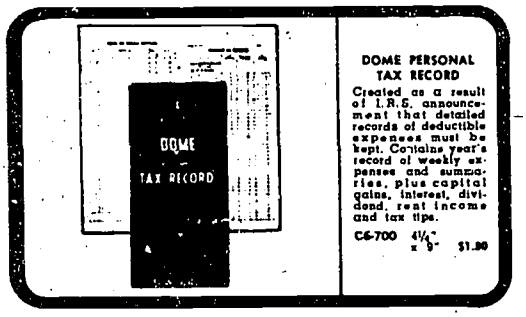

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TOTAL
SHIPPING & HANDLING
TOTAL AMOUNT ENCLOSED

	National Percentages Answering Acceptably*
Date	90%
Name	97
Address	96
Expense account diary	84
Personal tax record	83
Adjustable dispenser	83

**Criteria for acceptable responses are found in the* Career and Occupational Development Technical Report: Exercise Volume, Report 05-COD-20 *(Washington, D.C.: Government Printing Office, 1976).*

choices, one must be aware of the variety of jobs that exist and have some knowledge of their various requirements. One must also be aware of factors common to many employment situations. To be an effective member of our mobile and rapidly changing work force, one must also know how to improve skills, what factors affect hiring and promotion,

how to accept responsibility and what conventions generally govern employer-employee relationships.

Table 5 lists some of the tasks that were included in the NAEP assessment of job knowledge.

Do the same groups that lack ability in basic skills also lack knowledge about jobs? Unfortunately, the answer is yes.

TABLE 5. Samples of Job-Knowledge Exercises Assessed

Know relative salaries of various jobs
Know type and/or approximate length of training needed for different jobs
Recognize duties of a number of jobs
Be aware of concepts of worker responsibility
Recognize that people seek different things from their jobs
Know methods of improving job skills
Recognize factors that affect hiring and promotion

Level of Personal Education

Approximately 6 out of 10 persons in the lowest education group (ninth grade or less) on the average were successful on the job-knowledge questions, compared with 9 out of 10 persons for the highest education group (attended graduate school). Figure 5 displays performance of the two groups.

Relative to the nation, persons with a ninth-grade education or less did very poorly on several exercises about planning ahead for jobs or careers and on several exercises about promotions — reasons for receiving promotions, reasons for rejecting promotions. Performance of this group on these exercises was more than 30 percentage points below the percentages for the nation as a whole.

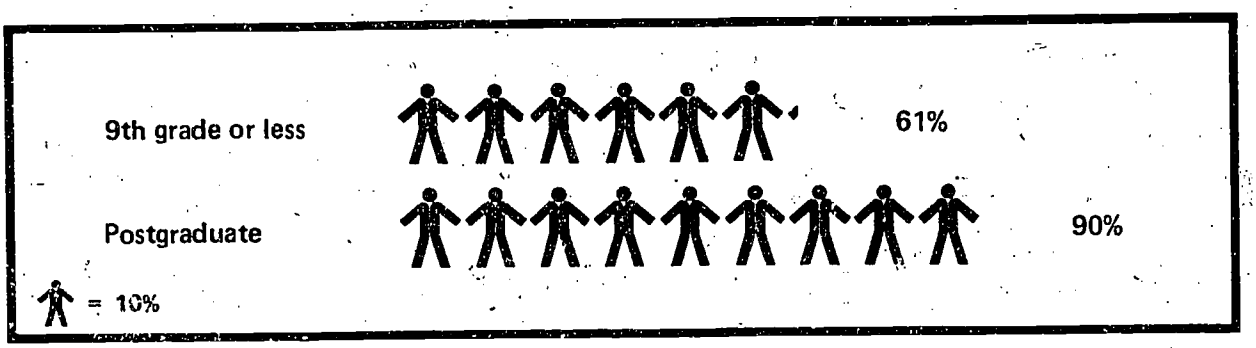
Family Income

People with lower incomes also have less knowledge about jobs, as shown in Figure 6. On the average, 31% of those with incomes under $5,000 could not answer the items about job knowledge. In contrast, an average of only 13% of those who had incomes over $15,000 were unsuccessful.

Size and Type of Community

The pattern seen in the basic skills items was repeated in the job-knowledge items. A total of 15 percentage points separated average performances of the high- and low-metropolitan groups (see Figure 7). Those in the low-metropolitan group, like those in the lowest education group, had considerable difficulty relative to the nation on the exercises about planning for careers and about reasons for promotions.

FIGURE 5. Education: Differences in Average Performance on Job-Knowledge Exercises



Race

Performances of blacks and whites were separated by 15 percentage points. Blacks averaged 68% correct on the job-knowledge items, while the average percent correct for whites was 83%. Figure 8 illustrates this difference. Blacks had considerable difficulty with the items concerning career planning — their results were 25 or more percentage points below the nation on these items.

FIGURE 6. Family Income: Differences in Average Performance on Job-Knowledge Exercises

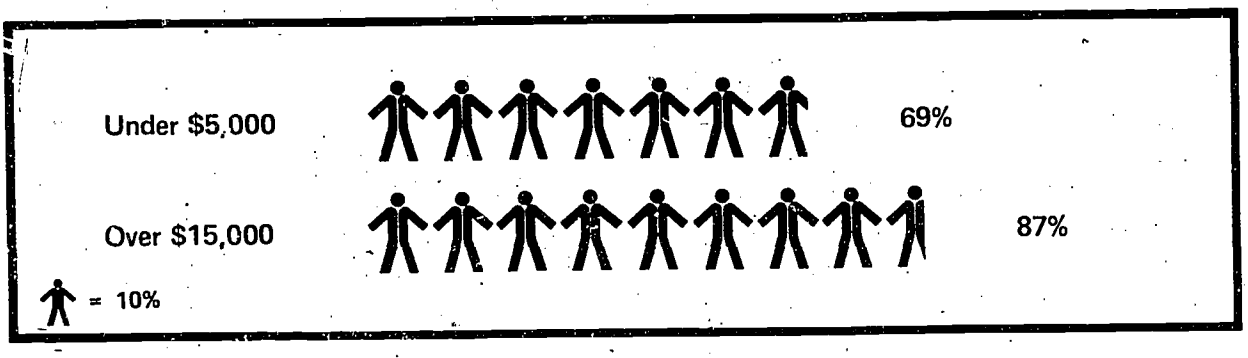


FIGURE 7. Size and Type of Community: Differences in Average Performance on Job-Knowledge Exercises

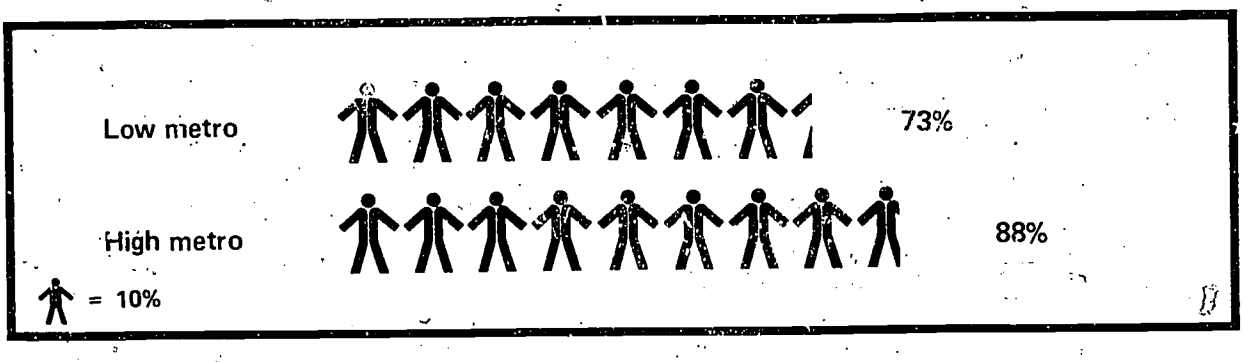
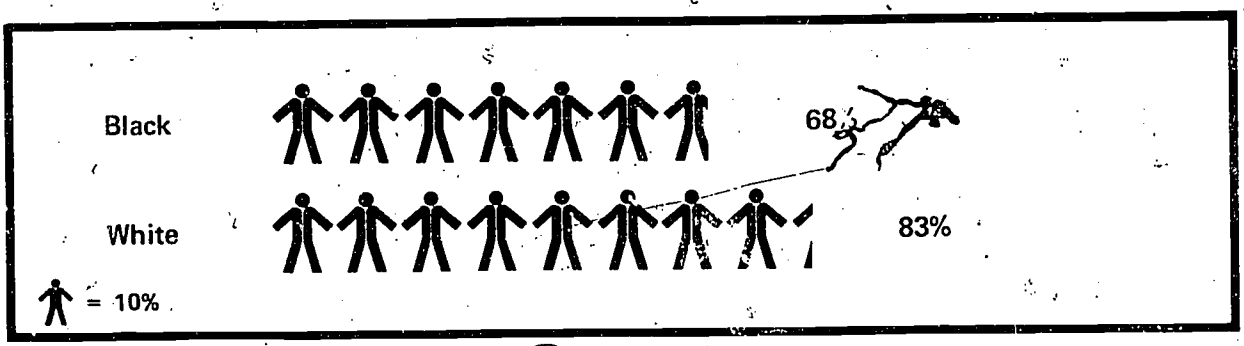


FIGURE 8. Race: Differences in Average Performance on Job-Knowledge Exercises



Sample Exercises and Selected Results: Job-Knowledge Exercises

Some of the actual items used in the assessment of job knowledge are presented here to give a better understanding of the nature of the assessment. These exercises do not represent all items in the assessment, and results for individual exercises may be somewhat at variance with the averages for all job-knowledge items.

The differences in performance between groups were smaller than the average differences on an easy item involving recognition of the duties associated with a fairly familiar job. This exercise is shown in table 6.

TABLE 6. Sample Exercise and Selected Results: Duties of Automobile Mechanic

Which one of the following jobs requires heavy lifting, crawling and bending?

	National Percentages
● Automobile repairman	94%
○ Salesman	0*
○ Barber	0*
○ Railroad engineer	5
○ I don't know.	1

Percentages Correct — Selected Groups

Education		Family Income	
9th grade or less	83%	Under $5,000	90%
Postgraduate	95	Over $15,000	96
Community Type		**Race**	
Low metro	86	Black	89
High metro	97	White	95

**Rounded percents less than one.*

However, on another exercise that asked about training required for a specific job, not only was the overall percentage of success lower but the separation between group performances was considerably larger. This exercise and selected results appear in Table 7.

TABLE 7. Sample Exercise and Selected Results: Training for Registered Nurse

Which one of the following jobs usually requires the LONGEST period of training?

	National Percentages
● Registered nurse	85%
○ Practical nurse	1
○ Hospital orderly	0*
○ X-ray technician	11
○ I don't know.	3

Percentages Correct — Selected Groups

Education		Family Income	
9th grade or less	61%	Under $5,000	76%
Postgraduate	95	Over $15,000	92
Community Type		**Race**	
Low metro	73	Black	74
High metro	96	White	87

** Rounded percent less than one.*

The next sample exercise concerned knowledge useful for any job — things one should think about in choosing a job or career. To be included in the percentage of persons answering the question correctly, a respondent had to give five or more "acceptable" responses. The exercise and percentages correct for the nation and selected groups are shown in Table 8.

Table 9 shows the most frequently used "acceptable" categories for this exercise and the percentage of people who gave at least one response in these categories. This percentage indicates the percentage of people in

the population who used a certain category but eliminates credit for repetition of the same category on more than one line.

TABLE 8. Sample Exercise and Selected Results: Planning for a Job or Career

List ten different things that a person should think about in choosing a job or career.

(1) _____
(2) _____
(3) _____
(4) _____
(5) _____
(6) _____
(7) _____
(8) _____
(9) _____
(10) _____

Percentages Giving Five or More Acceptable Responses

National Percentage 81%

Education		Family Income	
9th grade or less	38%	Under $5,000	59%
Postgraduate	100	Over $15,000	90
Community Type		**Race**	
Low metro	63	Black	56
High metro	92	White	85

Cautions in Interpreting the Data

Although National Assessment reports data on the achievement levels of various groups, the causes for the differences in achievement levels cannot be ascribed solely to membership in a particular group. Membership may be a symptom of the lack of achievement rather than a cause. Also, each person is, of course, a member of many groups. Everyone belongs to an education group, an income group, a community-type group. Membership in some of these groups is overlapping. For example, many of those who live in "inner-city" areas also have low incomes and low levels of education; many of those living in high-metropolitan areas have high incomes and high levels of education.

TABLE 9. Most Frequently Used Acceptable Categories and Percentages Giving at Least One Response in These Categories: Planning for a Job or Career

Response Categories	Percentages Giving at Least One Response in a Category
Working conditions, mechanical aspects of job	90%
Personal satisfaction, interests, desires or goals	71
Prestige, status, opportunity for advancement	50
Qualifications one has for job (training, experience, education)	45
Personal abilities or constraints (intelligence, personality, physical ability)	42
Availability (present and future) of the job	39

Which of these group memberships affects achievement and to what degree? At this point in our investigations, these questions cannot be answered. In future analyses, we may be able to factor out the performance of different groups so that the influence of membership in other groups will be reduced. However, in considering the data presented in this report, it must be remembered that the variables do not stand alone, and that factors other than membership in a particular group may affect performance. Although group

membership and achievement levels are obviously related, causality cannot be assigned.

In order to provide fair and accurate data on group performances, National Assessment makes every attempt to insure that its items are free from racial, ethnic or sexual bias. Although it is difficult to eradicate all the biases inherent in a testing situation, NAEP exercises and scoring guides were carefully reviewed by groups of consultants that included representatives of minority groups.

Implications of the Data

The data presented in this report indicate that some groups in the American adult population are indeed "unequal" in basic skills and job knowledge. It is reasonable to assume that their opportunities for improving their living conditions are likely to be severely limited.

This fact raises a number of questions, questions that do not lend themselves to simple answers or rapid solutions. The conditions that exist have been reinforced over a considerable number of years, and the patterns that have been established will be difficult to break. However, the questions must be asked. Are we satisfied that 35%, slightly over one-third, of those in the lowest education category successfully computed a finance charge? Is it alarming that almost 40% of the lowest income group did not use a sales tax table correctly? That approximately one-third of the low-metropolitan residents did not fill in the order on a mail order form acceptably? In considering the entire COD assessment of basic skills, we find that while the average percent correct for the nation was 73%, the average for blacks, low-income and low-metropolitan groups was approximately 60% and for the lowest education group, about 50%. Thus, two-fifths to one-half of the people in these less advantaged groups had difficulty in performing basic skills.

Are the prospects any better on the job-knowledge items? The national overall percentage of success was 81%, higher than for the basic skills items. However, the differences between the nation and the less advantaged groups were only slightly smaller on the job-knowledge items. Average percentages of success were as follow: blacks — 68%; low metropolitan — 73%; lowest level of education — 61%; and under $5,000 family income — 69%.

What remedies can be applied to lessen the inequalities in skills and knowledge that exist? Various continuing- and compensatory-education programs are either in the planning stages or are currently being implemented. How effective are those programs? Can we be sure that these programs are reaching the people who need them the most? National Assessment data on reading[2] suggest that adults who are big-city residents, or black, or whose parents have a low level of education (COD data indicate that parental education and education of the individual are related) have comparatively weak reading skills. Thus, the traditional use of printed materials to advertise educational opportunities may not be particularly effective. Further research to determine better ways to encourage adults to learn basic skills is needed.

This documentation of inequalities in achievement in basic job skills and job knowledge is but a first step. Further investigations can perhaps establish more definite causal links between one's life situation and achievement levels. Commitment to policies to diminish inequalities is also necessary. Otherwise we may become a society in which a widening gap in skills and knowledge separate advantaged and disadvantaged groups. We hope that these data reported by National Assessment will inspire further research and discussion so that in the future all American adults will be equipped with the basic skills needed to participate in the society in which we live.

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[2] *Reading: Summary Data, Report 02-R-00* (Washington, D.C.: Government Printing Office, 1974).

Other Findings

Other findings discussed in this report are the following:

1. Although level of achievement consistently increased as level of personal education increased, the extent of the improvement was not necessarily the same for each increased level of education. For example, the differences between those with a ninth-grade education or less and those with some high school education (grades 10—12) were always substantial, as were differences between those with some high school and high school graduates. Differences between high school graduates who had and had not attended vocational school and between vocational school attendees and people who had had some college were more dependent on the nature of the subject matter being assessed. Performance of college graduates was always above that of nongraduates; however, differences in results for college graduates and for those who had also attended graduate school again tended to fluctuate with the subject matter.

2. Differences in male-female performance appeared highly dependent upon the nature of the task. Males did better on the computation/measurement, manual/perception and specific job-knowledge items. There was little difference between the sexes on the content areas of graphic/reference-materials skills and general job knowledge; females were superior in written-communication skills.

3. Regional differences in performances followed a consistent pattern from one COD content area to another. Performance of the Southeast region was the furthest below that of the nation, while that of the Central region was furthest above.

4. Adults who had attended tax-supported (public) high schools did not differ significantly in achievement levels from those who had attended nontax-supported (private or parochial) high schools.

5. Persons who had participated in some type of continuing education (i.e., adult education, on-the-job training, correspondence courses) did better than those who had not. Those who had participated in continuing education that they felt was helpful to their job did better still.

6. The level of education attained by one's parents was also related to performance. Those whose parents had less than a high school education performed below the national level, while those with one or both parents who had graduated from high school performed above the national percentage.

7. Blacks, people from low-metropolitan areas, people with annual family incomes under $5,000 and people with less than a tenth-grade education had average performance levels below that of the nation in all cases. Conversely, whites, people from high-metropolitan areas, people who had graduated from college or attended graduate school and people with annual family incomes over $15,000 consistently showed average results above those of the nation.

8. The differences between blacks and whites, extremes in metropolitan size-and-type-of-community groups and highest and lowest family-income groups were largest in two basic skill areas — computation/measurement skills and graphic/reference-materials skills.

9. The highest and lowest education groups were most widely separated on the general job-knowledge items and on written-communication skills.

CHAPTER 2

REPORTING THE DATA: DEFINITIONS AND METHODOLOGY

This chapter contains definitions of the population groups and item sets analyzed in this study and a description of the conventions that are used to report the data.

Population Groups Included in the Study

Education

In this report eight education categories describe the level of an adult's education. These categories appear in Table 10 along with the percentages of adults in each one.

TABLE 10. Educational Categories and Percentages of Adults in Each

Educational Categories	Percentage of Adults in Each Category
1. 9th grade or less	10%
2. Some high school	13
3. Graduated high school, no vocational school	20
4. Graduated high school, attended vocational school	9
5. 1 year or less of college	13
6. 2–4 years of college	12
7. Graduated from college	10
8. Attended graduate school	11
9. Unknown	3*

** Figures may not total 100% due to rounding.*

The young adult (ages 26—35) population in 1973—74 consisted of all those born in the years 1938—47. These people would have entered elementary school (first grade) from 1944 to 1953, typically would have graduated from high school from 1956 to 1965 and from college from 1960 to 1969. Thus, about half of the young adults would have completed high school before the public opinion effects of the Russian launching of Sputnik in 1957 were felt in the schools, while the younger adults might have been affected by some of the curriculum changes of the 1960s.

Some of the respondents attended tax-supported high schools and others nontax-supported high schools. The report compares achievement of these two groups.

Adults are also divided into groups according to whether or not they have had any continuing education, including correspondence courses, on-the-job training and adult education courses. Those who had such education were further categorized as to whether or not, in their estimation, the continuing education had helped them in their jobs.

Family Income

Four levels of annual family income are analyzed: under $5,000 per year, $5,000—10,000, $10,000—15,000 and over $15,000.[1] Table 11 shows percentages of adults in each category.

[1] Incomes are at 1973 levels and have not been adjusted for subsequent inflation. Earnings for the age level 26—35 are higher than figures for the labor force as a whole, which includes all those over 16 who are either employed or looking for work.

TABLE 11. Annual Family-Income Categories and Percentage of Adults in Each

Family-Income Categories	Percentage of Adults in Each Category
1. Under $5,000 per year	8%
2. $5,000–10,000 per year	24
3. $10,000–15,000 per year	33
4. Over $15,000 per year	33
5. Unknown	2

Sex

Results are presented for males and females. Forty-eight percent of the adults are male and 52% are female.

Race

Currently, results are reported for blacks and whites. Whites comprise 86% of the adults and blacks 11%. The remaining 3% are classified as "other."

Size and Type of Community

Community types are identified both by the size of the community and by the type of employment of the majority of people in the community.

High metro. Areas in or around cities with a population greater than 200,000 where a high proportion of the residents are in professional or managerial positions.[2] Twelve percent of the adults were in this category.

Low metro. Areas in or around cities with a population greater than 200,000 where a high proportion of the residents are on welfare or are not regularly employed.[2] Eight percent of the adults lived in this type of community.

[2] Occupations of residents were determined from 1970 Census data.

Extreme rural. Areas with a population under 10,000 where most of the residents are farmers or farm workers.[2] This category included 10% of the adults.

Urban fringe. Communities within the metropolitan area of a city with a population greater than 200,000, outside the city limits and not in the high- or low-metro groups. Eleven percent of the adults lived in urban-fringe areas.

Main big city. Communities within the city limits of a city with a population over 200,000 and not included in the high- or low-metro groups. Nine percent of the adults were in this category.

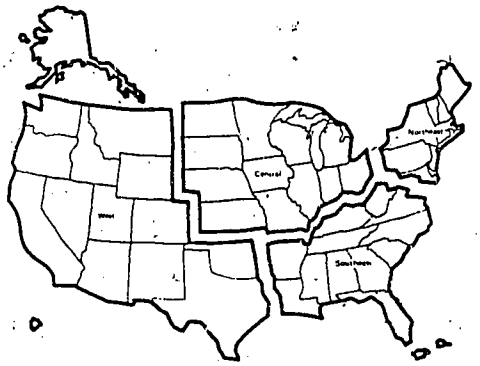
Medium city. Cities with populations between 25,000 and 200,000. Ten percent of the adults lived in medium cities.

Small places. Communities with a population under 25,000 and not in the extreme-rural group. Forty percent of the adults lived in small places.

Region

The country has been divided into four regions — Northeast, Southeast, Central and West. The states that are included in each region are shown in Figure 9. Percentages of adults in each region are the following: Northeast — 26%; Southeast — 22%; Central — 26%; West — 26%.

FIGURE 9. National Assessment Geographic Regions



Parental Education

Four categories of parental education are defined by National Assessment. These categories include: (1) those whose parents have had no high school education (25%), (2) those who have at least one parent with some high school education (16%), (3) those who have at least one parent who graduated from high school (30%) and (4) those who have at least one parent who has had some post high school education (25%).

Tasks Included in the Study

The items included in the summaries for this report all involved knowledge and skills related to the world of work. Other assessment items dealt with attitudes toward work, personal work experiences and knowledge about one's own abilities and interests. However, for the purpose of this report, which was to compare performance of various adult population groups, the items included were limited to job-related knowledge and skills.

The items were grouped in two major categories: (1) knowledge about jobs and (2) knowledge or skills generally useful in the world of work. Knowledge about jobs was further broken down into knowledge about jobs and job conditions in general — for example, ways to help get oneself promoted, things to think about in choosing a career and methods of improving job skills — and knowledge about specific jobs — such as pay rates, duties and length of training required.

Four types of knowledge and skills comprised the second major category. They were as follows:

1. Computation/measurement skills.
2. Graphic/reference-materials skills.
3. Written-communication skills.
4. Manual/perceptual skills.

Computation/measurement skills included such items as calculating area in square feet and square yards, converting decimals to fractions and using a ruler. Use of graphic/reference materials demanded knowledge of certain conventions; for example, how to use graphs and charts, dictionaries, telephone books and measuring instruments. In the written-communication section, respondents were asked to fill out an order blank, write a classified ad and write a job application letter. Manual/perceptual skills involved such things as following oral directions to complete a nonverbal task and drawing a three-dimensional object in perspective.

Summarizing the Data

Examining the data from each career and occupational development (COD) item included in the two major COD knowledge categories would result in an unmanageable proliferation of numbers. Thus, this report employs summary values to describe the general performance of various groups of the population on different sets of items. Summary values are useful in that they show typical achievement levels; however, it must be remembered that they do tend to mask extreme cases.

In this report, the mean (simple average) of a set of results is used as the measure of central location. Percentages for each item in a particular content group were averaged to obtain a national mean. The differences in performance between a reporting group and the nation on each item were averaged for each group, providing mean differences from the national performanc

Conventions of Reporting the Data

National Assessment uses a national probability sample to estimate the percentage of individuals in a given group who could successfully complete a given item. Thus, for example, when we say that "85% of the adults gave a correct response," we mean that

85% is an estimate of the proportion of all adults in the country ages 26–35 who could have answered correctly. As in any survey work, the percentage estimates are subject to sampling error because observations are made only on a sample, not on the entire population.

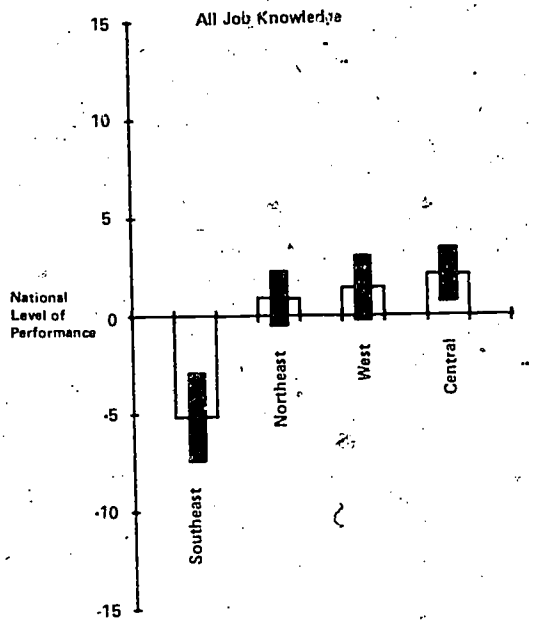
The particular sample used in this survey is one of a large number of all possible samples of the same size that could have been selected using the same sample design. Percentages obtained from each of the possible samples would differ from each other, and the standard error of these percentages, if it were known, would provide a measure of the sampling variability among all possible samples. In this report, standard errors are estimated both for specific exercises and for the mean percentage on a group of exercises for each population group.

The standard error of a sample statistic can be used to construct a confidence interval for the estimate. The interval from two standard errors below to two standard errors above the particular sample value would include the average of all possible sample values in about 95% of the samples. An interval computed in this manner is called a 95%-confidence interval to indicate how confident we are that the interval contains the average overall possible samples.

The graphs showing a group's mean difference from national performance display both the estimated mean and the 95%-confidence interval. An example of this type of graph appears in Figure 10; it illustrates performance of the four regional groups (Northeast, Southeast, Central and West) on all job-knowledge items. The Central region has a mean difference of +2.1 and a standard error of 0.66. This mean is represented by the white bar on the graph, and a 95%-confidence interval, ranging from +.78 to 3.42, is indicated by the black bars. The black bar shows the size of the confidence interval. Since this interval does not include the national level, represented by the zero line, we can say with 95% confidence that the performance of the Central region is above that of the nation. Similarly, we can be 95% confident that the performance of the Southeast is below that of the nation; however, we cannot make a 95%-confident statement about the performance of the Northeast or West relative to the nation.

These graphs only display confidence in differences between groups and the nation, not between different groups. Differences between different group performances will be discussed in this report only if a 95%-confidence interval indicates that the difference exists.

FIGURE 10. Sample Graph Showing Mean Differences and 95%-Confidence Intervals on Job-Knowledge Exercises: Regional Variable



Organization of the Report

Four variables, level of education, family income, sex and race, are discussed in detail for each of the six content areas included in this report. The other variables did not show as much variation in results across content areas and are summarized in Chapter 9, Additional Variables.

Released Exercises

National Assessment released approximately half of the exercises administered in the COD assessment. The unreleased exercises will be reassessed in a future assessment to provide measures of change in ability levels. In this report, results for both released and unreleased exercises are summarized; however, exercise text appears only for released exercises. Copies of all released COD exercises are available from National Assessment upon request.[3]

[3] *Career and Occupational Development Technical Report: Exercise Volume. Report 05-COD-20* (Washington, D.C.: Government Printing Office, 1976).

Additional Information

This report concerns adult performance on selected career and occupational development items. Other planned reports include a report on basic skills for 9-, 13- and 17-year-olds; a survey of work experiences, values and attitudes of 17-year-olds and adults; and a general overview of all results from the COD assessment. Technical reports include an exercise volume, which presents all released exercises with scoring guides and results for these exercises, and a summary volume, which will provide documentation for all summary results.

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CHAPTER 3

COMPUTATION AND MEASUREMENT SKILLS

The following four chapters deal with general skills that would be needed for almost any type of job, and the lack of which might severely limit one's chances in the job market. The computation/measurement items assessed skill in working with numbers and numerical concepts. Since the assessment obviously could not measure all "basic" numerical skills, certain aspects of computation/measurement were selected to measure numerical skills. Computation is concerned with the manipulation of numbers using the four arithmetic operations of addition, subtraction, multiplication and division; measurement is used to quantify things in terms of specific units.

Exemplary Exercises: Computation and Measurement Skills

Selected items and their results are presented in the following tables only in order to give an understanding of the composition of the assessment; specific results may be at variance with trends evidenced by the summary data.

Two measurement-conversion items with national and selected group results appear in Table 12. The level of performance was high for the first item, with only 4% of the adults failing to recall that one minute equals 60 seconds. The percentage of success on the second exercise, in which some computation was necessary to find the answer, was lower. Blacks, people with a low level of education and people with low family incomes had considerably more difficulty with the second problem.

Geometric measurements contain elements of both computation and measurement. For example, to figure an area, a skill required in many jobs, one must know the formula used to compute an area and must also be able to complete the computations successfully. Table 13 shows results for a typical geometry

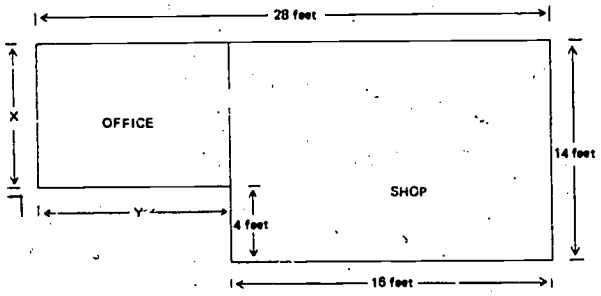
TABLE 12. Two Sample Exercises and Results: National Percentages and Selected Group Differences From National Performance for Two Measurement-Conversion Exercises

1 minute = (60) seconds			1½ pounds = (24) ounces	
Correct answer	96%		Correct answer	86%
Male	2*†		Male	1
Female	-1*		Female	-1
Black	-10*	**	Black	-26*
White	1*	**	White	4*
9th grade or less	-12*	**	9th grade or less	-32*
Postgraduate	4*	**	Postgraduate	7*
Under $5,000	-7*	**	Under $5,000	-20*
Over $15,000	3*	**	Over $15,000	7*

**Indicates significant difference from the nation.*
†Numbers indicate differences from the national percentages. For example, on the exercise on the left, results for males were 2 percentage points above the nation, or 98%.
***Indicates significant difference in a group's performance on the two exercises.*

TABLE 13. Sample Exercise and National Results: Figuring Area

Below is a layout of an office and shop area:



A. How many feet long is the office at Side X?

ANSWER (10 feet)

B. How many feet long is the office at Side Y?

ANSWER (12 feet)

C. How many square feet of floor space are there in the office?

ANSWER (120 square feet)

	National Percentages Answering Correctly
Part A	81%
Part B	77
Answered both parts A & B correctly	76
Part C	35

problem. This was a difficult exercise; about one-third of the adults figured the area of the office correctly.

Figure 11 shows the percentage of each of the selected groups answering part C correctly. Under 20% of the black and low-education groups responded correctly; approximately half of the adults who had attended graduate school gave the right answer.

Summary of Results: Computation and Measurement Skills

The differences between extreme groups for each variable on computation/measurement were among the largest for all content areas included in this report. Thirty-five percentage points separated percentages for the highest and lowest education groups; 23 percentage points separated white and black performance and 24 percentage points separated results for highest and lowest family-income groups.

Male performance was better than that of females on these items. In fact, the mean difference in performance between the two sexes was larger on the computation/measurement items than on any other item set in this report.

Level of Personal Education

Thirty-five percentage points separated the average percentages for the highest and lowest levels of personal education. Of course, differences between two such extreme groups as people with no high school education and people with postgraduate education do not tell the whole story. Figure 12 shows the distribution of mean differences and 95%-confidence intervals around those means for each of the eight personal-education groups.

Those who studied at a vocational school performed significantly better on these items than those who graduated from high school and received no further education. However, the difference in performance between vocational school students and people who had attended one year of college was negligible, as was the difference between college graduates and graduate school attendees. Differences between all other education groups were statistically significant.

Sex

Females performed considerably less well than males on the computation/measurement section of the career and occupational development assessment, especially in comparison with their performance in other areas. Seven percentage points separated the average

FIGURE 11. National and Selected Group Percentages of Success:
Figuring-Area Exercise

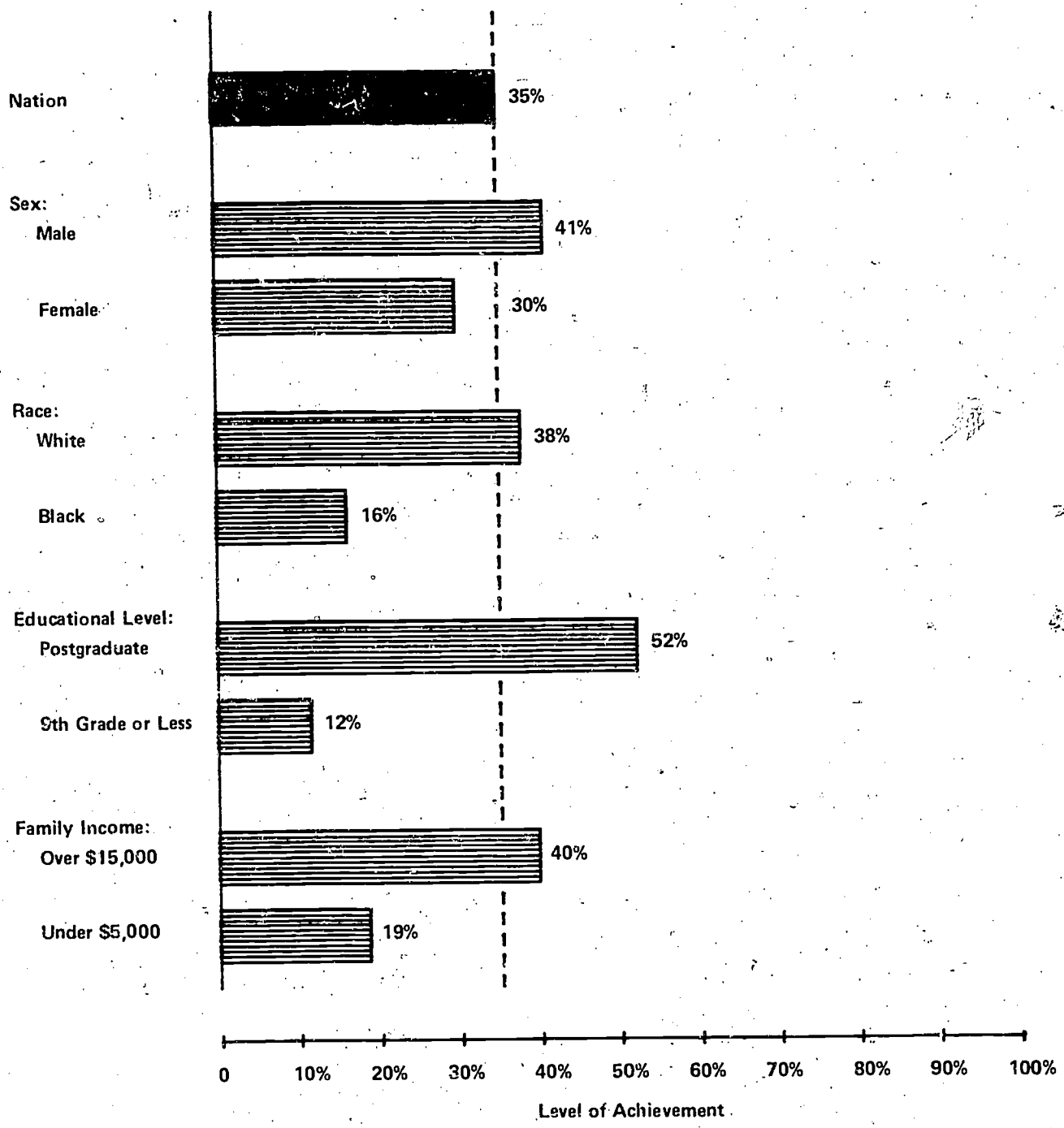
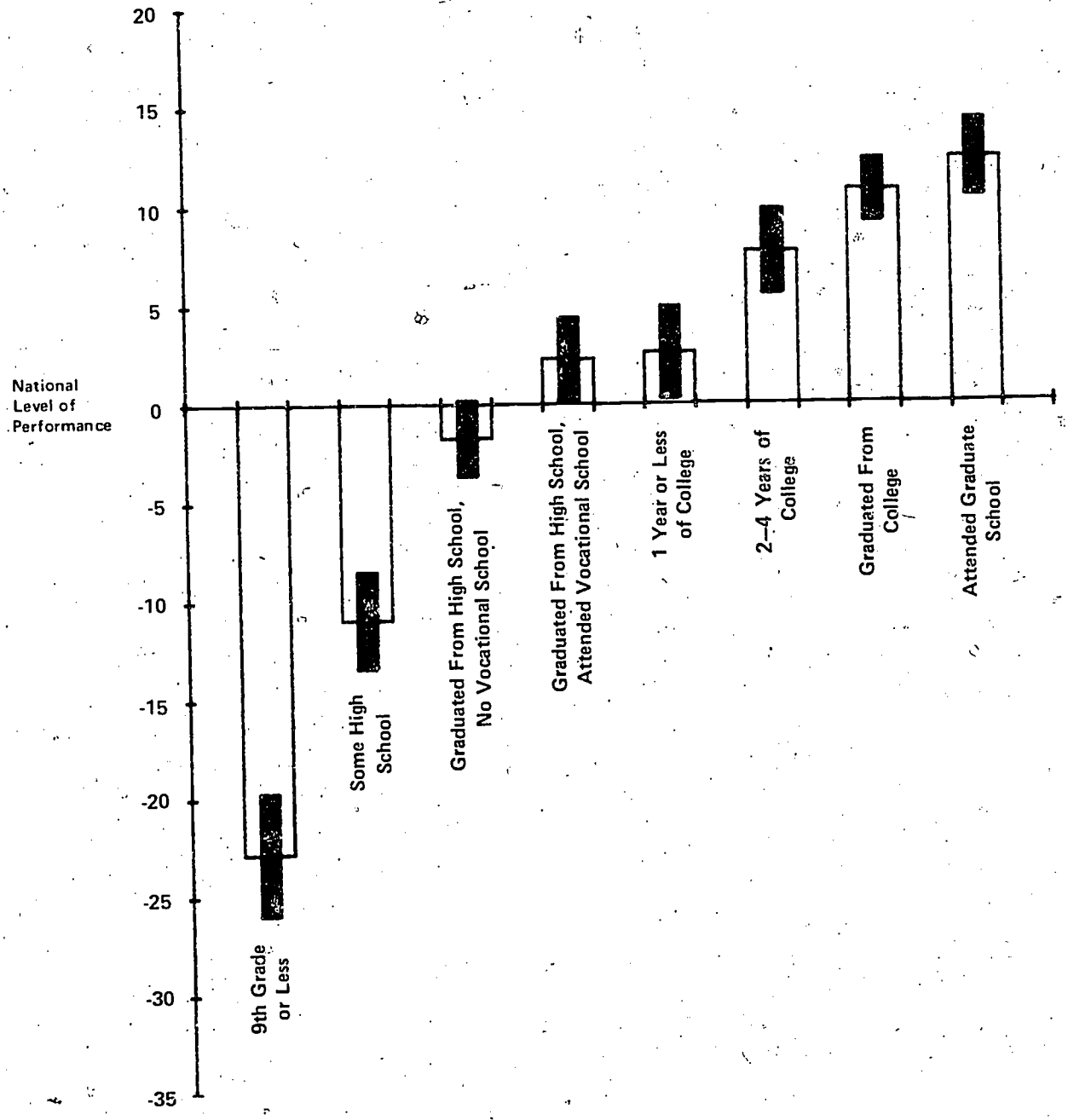


FIGURE 12. Computation and Measurement Skills: Mean Differences From National Performance — Education



results for adult males and adult females, with superiority shown by the males. Results for adult females were significantly above those for the nation on only two exercises, both dealing with adding up a column of figures on a mail order form. Male performance was furthest above that of females on questions about finding area and estimating amounts.

Race

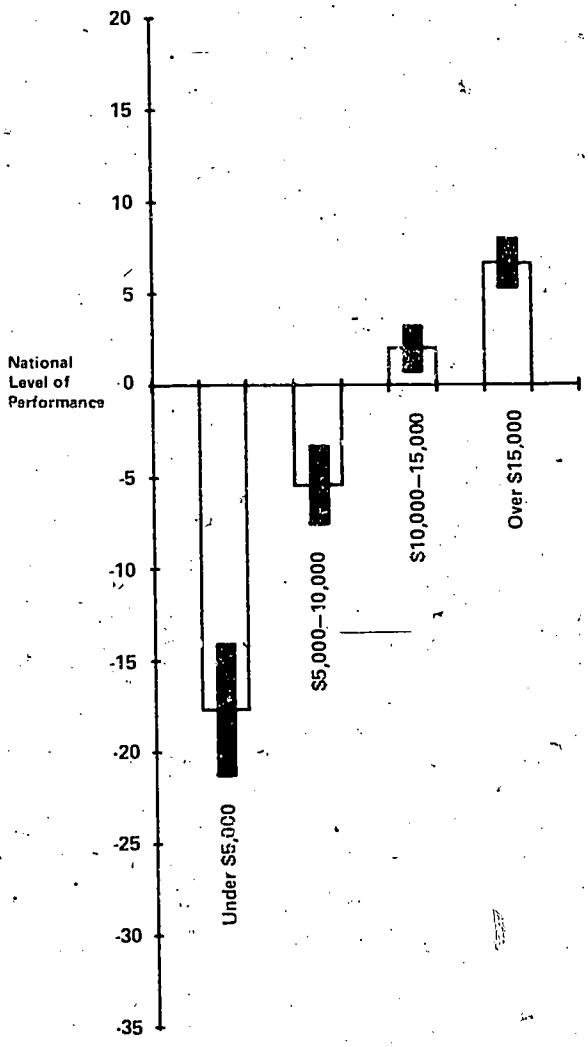
Blacks did not perform as well as whites on any of the knowledge and skill areas discussed in this report. However, differences between the two groups were largest on the computation/measurement and graphic/reference-materials skills content areas. These differences are all the more striking because national mean performances on these sections were 73% and 83%, respectively; thus, for the nation as a whole, they were relatively easy. The blacks' means, however, on these sections were 53% and 63%.

The black-white differences suggest an area for further research. It seems disturbing that the greatest black-white disparities are in these two "basic" skill areas, since these are areas essential to functioning both in the work world and in daily living. Lack of knowledge about jobs may limit one's horizons and aspirations; lack of basic skills will very likely limit one's ability to obtain any sort of job.

Family Income

Figure 13 shows mean differences from national performance and 95%-confidence intervals around the means for all family-income groups. Percentages of success for the highest and lowest family-income groups differed by 24 percentage points. Differences between income groups became smaller as family income increased: the difference separating the under—$5,000 and $5,000—10,000 family-income groups is considerably larger than the difference between the $10,000—15,000 and over—$15,000 groups.

FIGURE 13. Computation and Measurement Skills: Mean Differences From National Performance — Family Income



CHAPTER 4

GRAPHIC AND REFERENCE-MATERIALS SKILLS

In this report, graphic/reference-materials skills refer to conventions used in obtaining and interpreting certain types of information. These are not strictly reading or mathematics skills, although they often involve a little of each. Many different conventions have been included in this skill area, such as reading graphs, tables and maps, using reference books arranged in alphabetical order and reading demarcations on measuring instruments.

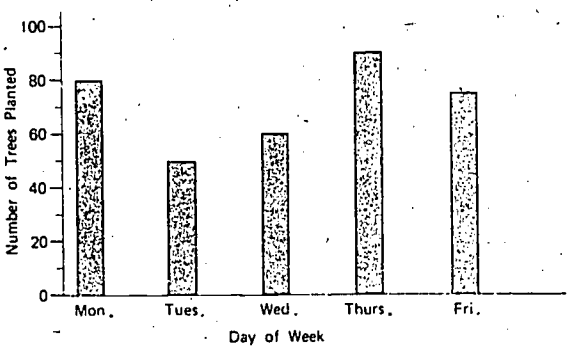
Many adults did indeed show mastery of the skills assessed; the national percentage of success was over 80% on more than three-fourths of these exercises. However, certain groups in the adult population apparently had difficulty in using these "basic" conventions and thus might be at a disadvantage in many aspects of daily life, including taking advantage of employment opportunities.

Exemplary Exercises: Graphic and Reference-Materials Skills

Several exercises are shown as examples of the type of item included in this section. The first exercise, shown in Table 14, asked respondents to read a bar graph. Most people appeared able to use the graph to locate information, but many had difficulty in reading the vertical scale successfully. Results for part A, trees planted on Wednesday, are much higher than for part C, trees planted on Friday. The bar for Friday is farthest away from the vertical scale and also represents an amount between the marks shown on the scale. Both of these factors probably contributed to the difficulty of part C.

TABLE 14. Sample Exercise and National Results: Bar-Graph Exercise, Parts A, B and C

Below is a bar graph that shows the number of trees planted along a highway in a week.



The graph shows that 80 trees were planted on Monday and 50 trees were planted on Tuesday.

	Percentage of Adults Answering Correctly
A. How many trees were planted on Wednesday? ANSWER (60)	94%
B. How many trees were planted on Thursday? ANSWER (90)	83
C. How many trees were planted on Friday? ANSWER (75)	50

Table 15 shows extreme group differences for parts A and C on the bar-graph exercise for sex, race, education and family income. Differences for part C, the more difficult question, are substantially greater than for part A.

TABLE 15. Selected Group Differences From National Performance: Bar-Graph Exercise, Parts A and C

	Part A		Part C
National percentage	94%		50%
Male	0†	**	7*
Female	0†	**	-7*
Black	-14*		-22*
White	2*		3*
9th grade or less	-19*		-26*
Postgraduate	5*	**	20*
Under $5,000	-9*	**	-20*
Over $15,000	4*	**	10*

**Indicates significant difference from the nation.*
†Rounded percents less than one.
***Indicates significant difference in group performance on the two exercises.*

Another exercise asked respondents to use a phone book to find a phone number. Respondents were timed on how long it took to find the phone number. Ninety-three percent of the adults found the phone number within three minutes. Males and females did equally well on this task. Adults who were black, from the lowest education group or the lowest family-income group performed some 14—16 percentage points below the national level. In other words, only approximately 77—79% of these groups located the correct phone number within three minutes.

A third type of graphic/reference-materials skill assessed was that of reading measurement instruments. Some of these exercises were also included in the computation and measurement section since they measured both types of skills. One of these items, examining skill in reading demarcations on a measuring cup, is shown in Table 2 in Chapter 1.

Summary of Results: Graphic and Reference-Materials Skills

The differences between extreme groups for the graphic/reference-materials exercises and for the computation/measurement exercises were similar for all except the sex variable. The extreme differences for race and family income on these two content areas were the largest of all included in this report; the distance between extreme groups for education was greatest on the general job-knowledge items.

Level of Personal Education

Figure 14 presents mean differences from national performance for the eight education groups. Contrary to performance on the computation/measurement exercises, there was no significant difference between high school graduates who had and had not attended vocational school. The increase in average level of achievement was fairly regular in relationship to the increase in the amount of college education except at the college graduate and postgraduate levels.

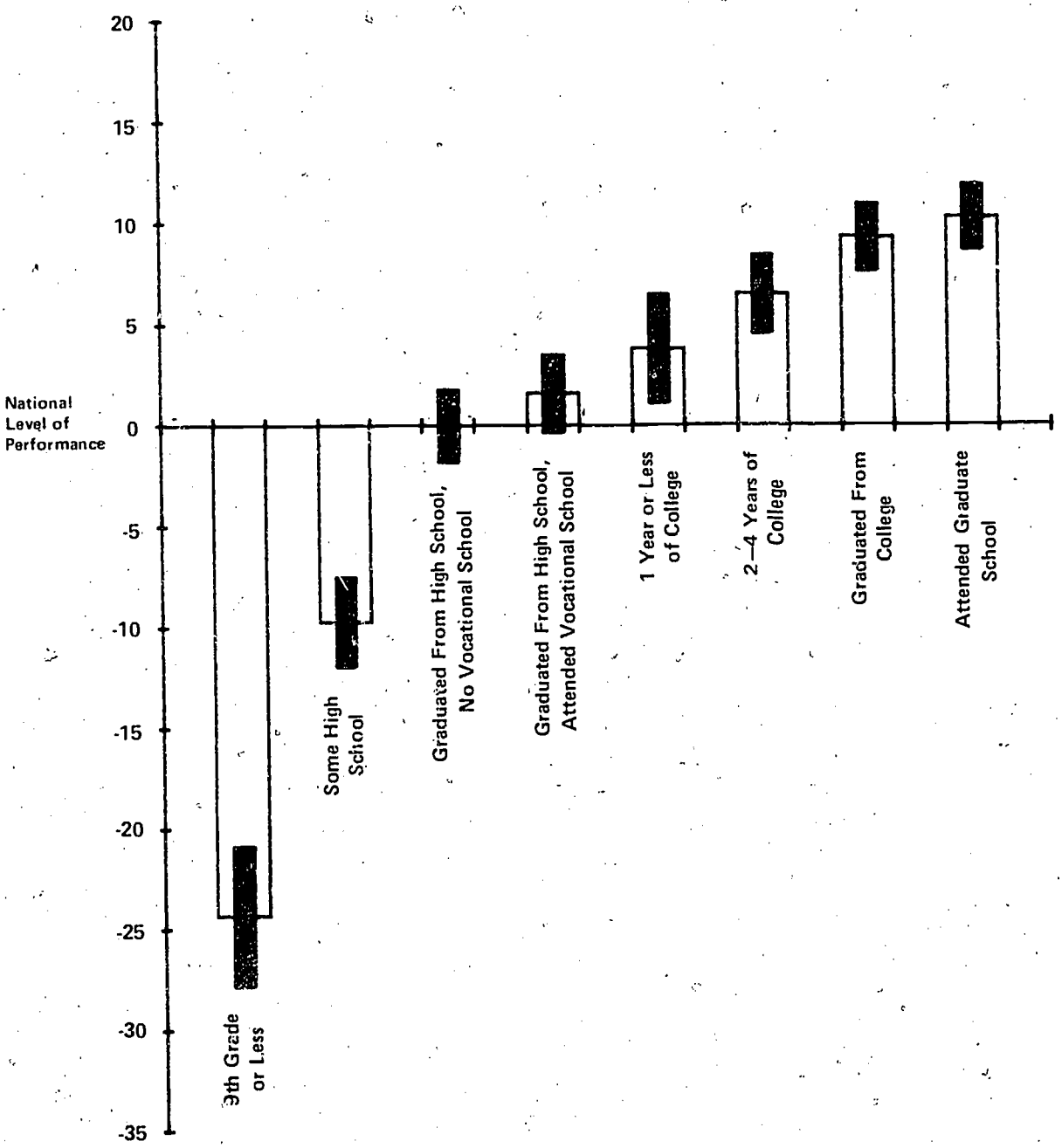
Group differences for education were generally smaller on items about using reference materials and reading measurement instruments than on reading graphs and tables. There were, of course, some exceptions to these generalizations. The measuring-cup exercise, shown in Table 2, proved difficult for some groups. The first part of the bar-graph exercise, shown in Table 15, did not generate large group differences for any except the lowest education group. In general, however, graphs and tables were the more difficult type of exercise for the two groups with less than a high school education.

Sex

Males and females performed equally well on these exercises. The only other group of exercises for which this was true were the general job-knowledge items.

Women were generally superior in reading simple tables, while males did better on problems using tables that required calculations, such as the income tax table item. Performance of both sexes was about the same on such skills as using a telephone book and reading a simple bar graph.

FIGURE 14. Graphic and Reference-Materials Skills: Mean Differences From National Performance — Education



Race

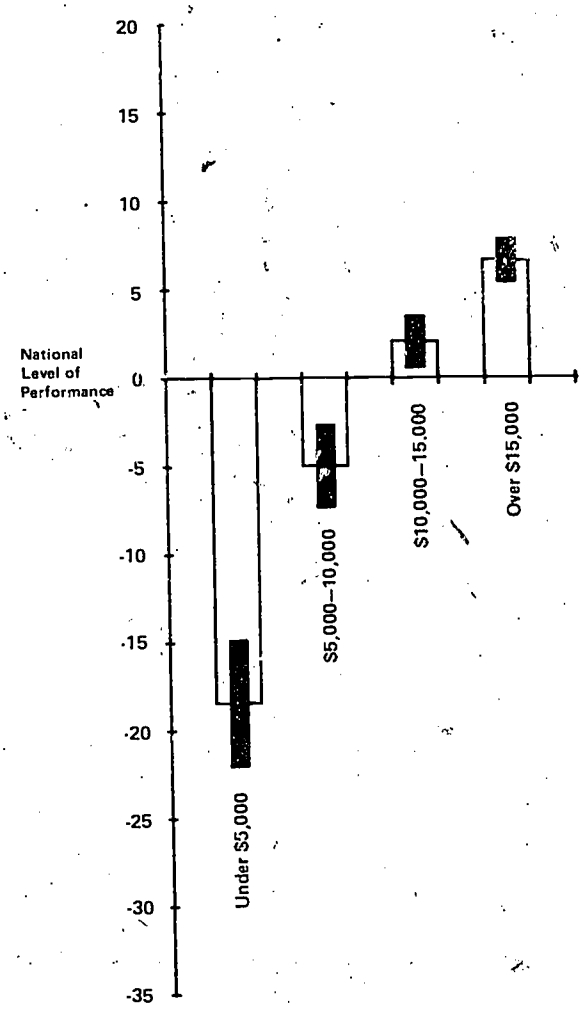
Twenty-three percentage points separated black and white average performance on the graphic/reference-materials items. Black performance was within 10 percentage points of white performance on only three items, all of which were concerned with use of reference materials. Items about using a map, a thermometer and sales tax tables caused blacks the most difficulty relative to the nation as a whole.

Family Income

The difference in performance separating the highest and lowest family-income groups on graphic/reference-materials skills items was very similar to the difference between the two groups on the computation/measurement skills items. There were 25 percentage points between these groups on graphic/reference-materials skills items and 24 percentage points on computation/measurement skills items. For both sets of skills, differences between family-income groups became smaller as the size of the family income increased. Figure 15 displays mean differences from the nation for all family-income groups on the graphic/reference-materials skills items.

The lowest income group tended to have more difficulty compared with the nation on exercises involving use of graphs and tables and was closest to national levels on exercises about using a clock, a calendar, a dictionary and a phone book.

FIGURE 15. Graphic and Reference-Materials Skills: Mean Differences From National Performance — Family Income



CHAPTER 5

WRITTEN-COMMUNICATION SKILLS

The exercises measuring writing ability in the career and occupational development (COD) assessment were strictly practical items that required certain writing skills but did not demand any particular creative ability. For example, one exercise involved filling out a mail order form and another concerned job application skills.

Exemplary Exercises: Written-Communication Skills

Results for the exercise asking respondents to fill out a mail order form, shown in Table 4, Chapter 1, were included in the written-communication skills content area. The percentage of acceptable responses was calculated separately for each line of the order blank, since one number would not adequately describe variations in performance on the different parts of the order blank and might also mask the existence or the location of meaningful group differences.

The exercise presented in Table 16 asked respondents to select one of the ads shown and to write a job application letter for that job. Several elements were identified as essential to a job application letter. They fell into two different categories: (1) those dealing with the format or mechanics of a business letter and (2) those dealing with content needed in a job application letter. Writing mechanics, such as spelling, grammar and punctuation, were not scored. The elements included in the scoring and percentages of success on each are also shown in Table 16.

The elements dealing with content were defined as those things that would usually be needed for an employer to grant an interview. The majority of adults managed to include at least some qualifications that they had for the particular job, and most also either described or made clear which job they were applying for. However, less than half provided a means, such as a return address or a phone number, for a prospective employer to contact them. Most people recognized the necessity for some type of greeting and a closing and signature, but the other formal elements of a business letter were often neglected.

Summary of Results: Written-Communication Skills

Overall percentages of success were lower for this set of items than for many of the other areas discussed in this report; however, group differences in performance were in general less sizeable. One exception was the range of differences for the education groups, which was slightly larger for this set of items than on the computation/measurement and graphic/reference-materials skills items.

Level of Personal Education

The difference between extreme education groups totaled 37 percentage points, the group with less than a tenth-grade education being 26 percentage points below the nation and the group with some postgraduate education 11 percentage points above. Figure 16 displays the mean difference in performance for each of the education groups for this set of items. In all cases, performance improved as amount of education increased.

People with less than a tenth-grade education did most poorly compared with the nation on

TABLE 16. Sample Exercise and National Results: Job Application Letter

Below are three ads from the Help Wanted section of a newspaper. Read all three ads and choose which job you would like best if you had to apply for one of them.

-Help Wanted-

OFFICE HELPER: experience in light typing and filing desirable but not necessary, must have 1 yr. high school math and be able to get along with people. $2.50/hr. to start. Start now. Good working conditions. Write to ACE Company, P. O. Box 100, Columbia, Texas 94082.

-Help Wanted-

SALESPERSON: some experience desirable but not necessary, must be willing to learn and be able to get along with people. $2.50/hr. to start. Job begins now. Write to ACE Shoestore, P. O. Box 100, Columbia, Texas 94082.

-Help Wanted-

APPRENTICE MECHANIC: some experience working on cars desirable but not necessary, must be willing to learn and be able to get along with people. $2.50/hr. to start. Job begins now. Write ACE Garage, P. O. Box 100, Columbia, Texas 94082.

Fill in the oval beside the ONE you choose.

On the next page, write a letter applying for the job that you chose. Write the letter as if you were actually trying to get the job. Use the name Dale Roberts.

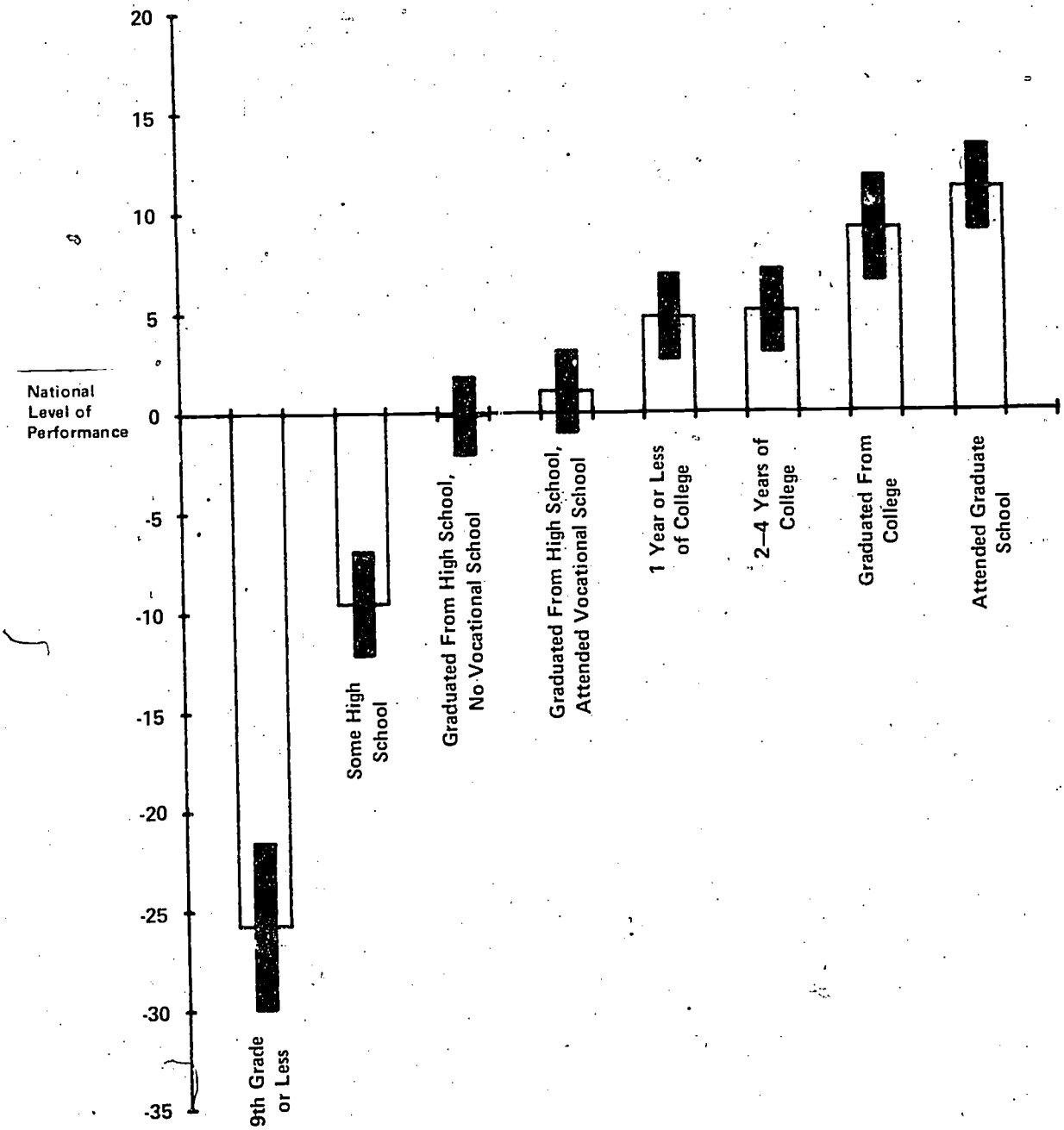
Write your letter of application in the box on this page:

Format*	National Percentages
Had acceptable:	
Greetings	88%
Closing and signature	78
Date	40
Inside address	39
Return address	24

Content*	National Percentages
Described qualifications acceptably	90%
Described job applied for	82
Gave way of contacting	42
Asked for interview	26
Gave references	14

Criteria for acceptable responses are found in Career and Occupational Development Technical Report: Exercise Volume, Report 05-COD-20.

FIGURE 16. Written-Communication Skills: Mean Diffcrences From National Performance — Education



the written-communication items in filling in the order lines on the order blank. Less than half of this group (43—46%) filled in the various lines correctly. These individuals were also below the national percentage for giving a name and address on the order blank—16% and 18% below, respectively.

The higher education groups ran into difficulty on one exercise simply because they were more verbose. This item asked respondents to write a classified ad. Fifty-four percent of those with less than a tenth-grade education and 66% of the people who had attended vocational school wrote advertisements of 21 words or less in length, while only 39% of the graduate school people did so. Seventeen percent of the graduate school group submitted ads over 40 words long.

Sex

Results for the two sex groups on the written-communication exercises were the opposite for those for the computation/measurement exercises — here, the average percent correct for females was 6 percentage points higher than that for males. The achievement patterns of males and females have been documented in other National Assessment reports.[1] In the writing assessment, conducted in 1969—70, the median male-female difference favored females at all ages. However, for all ages except 9-year-olds, males outperformed females in mathematics, the difference being largest at the adult level. The COD data corraborate these findings. Adult females do better than males in written communication but are not as proficient as males with numerical skills.

Females showed the greatest advantage in correctly including the formal parts of a business letter — 49% of the females and 30% of the males dated their letter correctly; 29% of the females and 18% of the males included an adequate return address, and 83% of the females and 72% of the males used a proper closing and signature. Male and female performance was most nearly the same on the order-blank question shown in Table 4.

[1] Ina Mullis, *Educational Achievement and Sex Discrimination* (Denver, Colo.: National Assessment of Educational Progress, 1975).

Race

Approximately 14 percentage points separated the two racial groups on this section, considerably less of a difference than for the computation/measurement and graphic/reference-materials sections (23 percentage points) and slightly less than for the general job-knowledge section (18 percentage points).

Blacks' difficulties with specific exercises paralleled those of the lowest education group. Blacks' performance was farthest below that of the nation on filling in the order lines on the order blank—approximately 55% to 57% of the blacks filled in the various lines correctly.

Whites were more likely than blacks to write ads of an appropriate length (21 words or less). Blacks did fairly well (less than 10 percentage points below the nation) on such things as including a return address, a date and information on how to contact them in their job application letter.

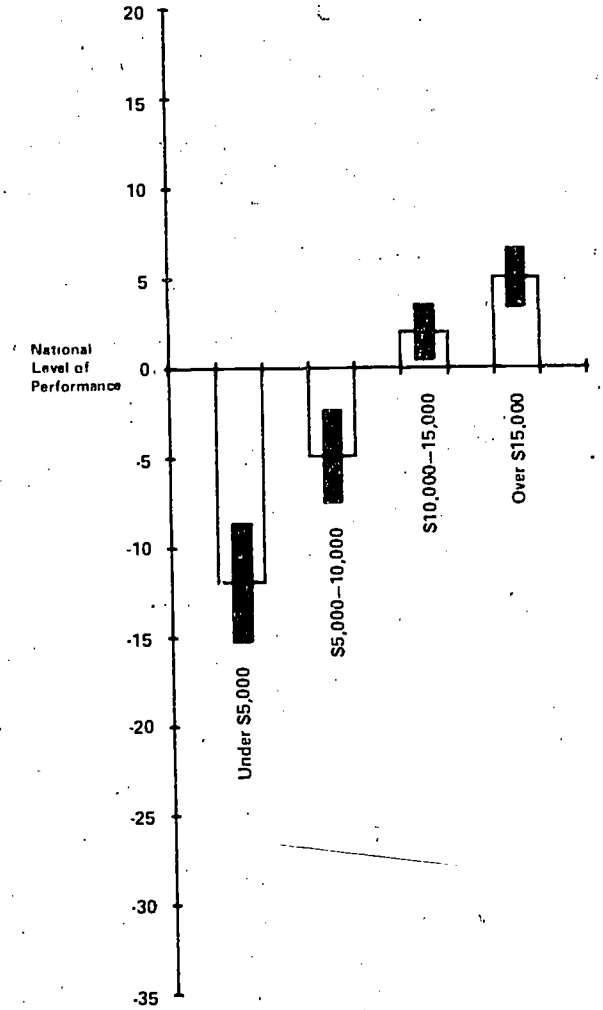
Family Income

The differences between the highest and lowest groups in the family-income variable were smaller for written-communication skills than for computation/measurement skills, graphic/reference-materials skills or general job knowledge. Figure 17 shows mean differences from the nation for all family-income groups. Level of ability again increased as family income rose.

People with low family incomes were closest to the national percentages on such items as filling out their name and address on the order form, writing a classified ad using less than 22 words and including a return address

on their job application letter. They had the greatest difficulty, relative to the nation, in filling in the lines on the order blank.

FIGURE 17. Written-Communication Skills: Mean Differences From National Performance — Family Income



CHAPTER 6

MANUAL AND PERCEPTUAL SKILLS

Manual-perceptual skills include a wide range of behaviors involving the coordination of perceptions — visual, aural or otherwise — and motor or muscular actions. The career and occupational development objectives for the 1973—74 assessment list such things as the ability to use common tools, to construct things, to complete simple repairs and to make visual representations. However, since some of these skills are difficult to measure in the assessment situation, the actual assessment covered a more limited area. Included in the manual-perceptual skills section were:

1. Following directions to manipulate objects.
2. Using measurement instruments.
3. Drawing a three-dimensional object.

Some of the exercises concerning measurement instruments are also summarized in the computation/measurement section.

Exemplary Exercises: Manual and Perceptual Skills

Table 17 shows an item used to assess ability to follow directions and manipulate objects. Respondents heard the directions printed to the right of the map but did not see them. They had to coordinate the instructions they heard with the movement of their pencils on the map.

Eighty-six percent of the adults finished at the proper end point. Figure 19 shows selected group performances for the exercise.

As one way of surveying measurement skill, people were given a ruler and asked to measure a line 3 3/8" long. Forty-six percent of the adults measured correctly; an additional 36% responded with some other number ranging from 3 1/4" to 3 1/2". Either response was considered acceptable.

Females did less well than males on this exercise, with a difference of 12 percentage points separating the two groups; other group results followed the typical patterns.

A third type of manual-perceptual skill involved drawing the three-dimensional object shown in Figure 18. Drawings were scored for three elements: (1) objects in correct relative position to each other; (2) objects drawn in perspective, showing third dimension; and (3) objects of correct size relative to each other. Percentages of success were the following: correct relative position — 69%, three-dimensionality — 56%, correct relative size — 20%.

FIGURE 18. Object Used for Three-Dimensional Drawing

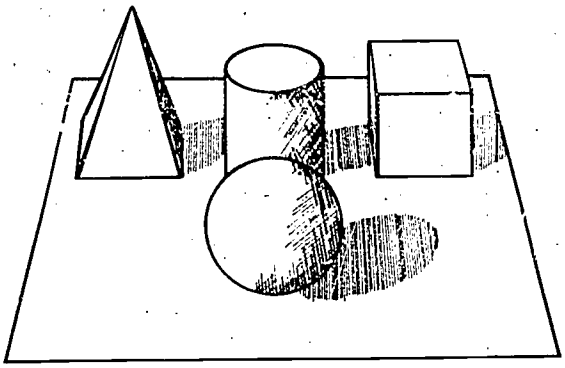
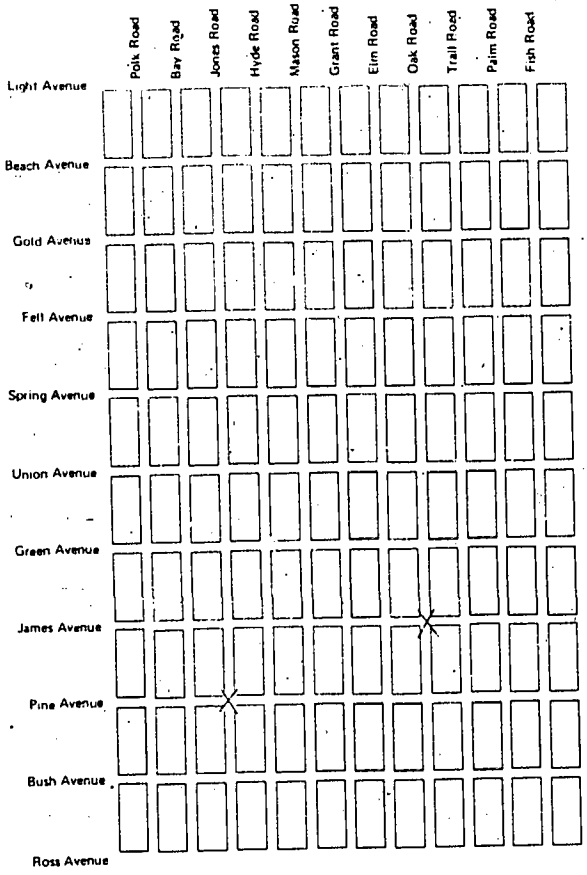


TABLE 17. Sample Exercise: Directions on Map



On this page is a map of streets in a city. The compass at the bottom of the map tells you which direction is north, south, east and west. First, I will tell you where you are in the city. Then I will give you instructions to follow to get from that place to another, such as, "Go one street west on Pine Avenue and then two streets north on Ray Road." You must listen carefully to me because I will not repeat the instructions. You should be at a certain place when I finish giving you the instructions.

Put your pencil point on the red X on the map. With your pencil point on the red X, you are at the corner of Pine Avenue and Jones Road.

This is where you are now. You may draw a line on the map with your pencil as I tell you where to go. Here are the instructions:

Go four streets north on Jones Road and hold your pencil at that point.

Now go five streets east on Spring Avenue and hold your pencil at that point.

Now go three streets south on Oak Road and hold your pencil at that point.

Now mark an X at the corner of the two streets where you are now.

Summary of Results: Manual and Perceptual Skills

Differences between extreme groups were generally smaller on this section than on all other sections except specific job knowledge. Overall performance on this section was not as high as it was in the specific job-knowledge section; average percent correct on the manual-perceptual skills exercises was 66% compared with 84% for the specific job-knowledge exercises.

What does success or failure on this varied group of exercises mean? These exercises are intended to serve as indicators for a range of skills. Since they are not necessarily representative of all or even of a majority of skills that might be classified as manual or perceptual, care must be used in generalizing the results. However, these exercises do provide a barometer of ability on a range of different skills and also indicate strengths and weaknesses in performances of various population groups.

Level of Personal Education

Twenty percentage points separated the average performance of those with less than a tenth-grade education and those who had done graduate work. Although one might expect manual/perceptual skills to be less closely linked to academic achievement,

FIGURE 19. National and Selected Group Percentages of Success: Map-Directions Exercise

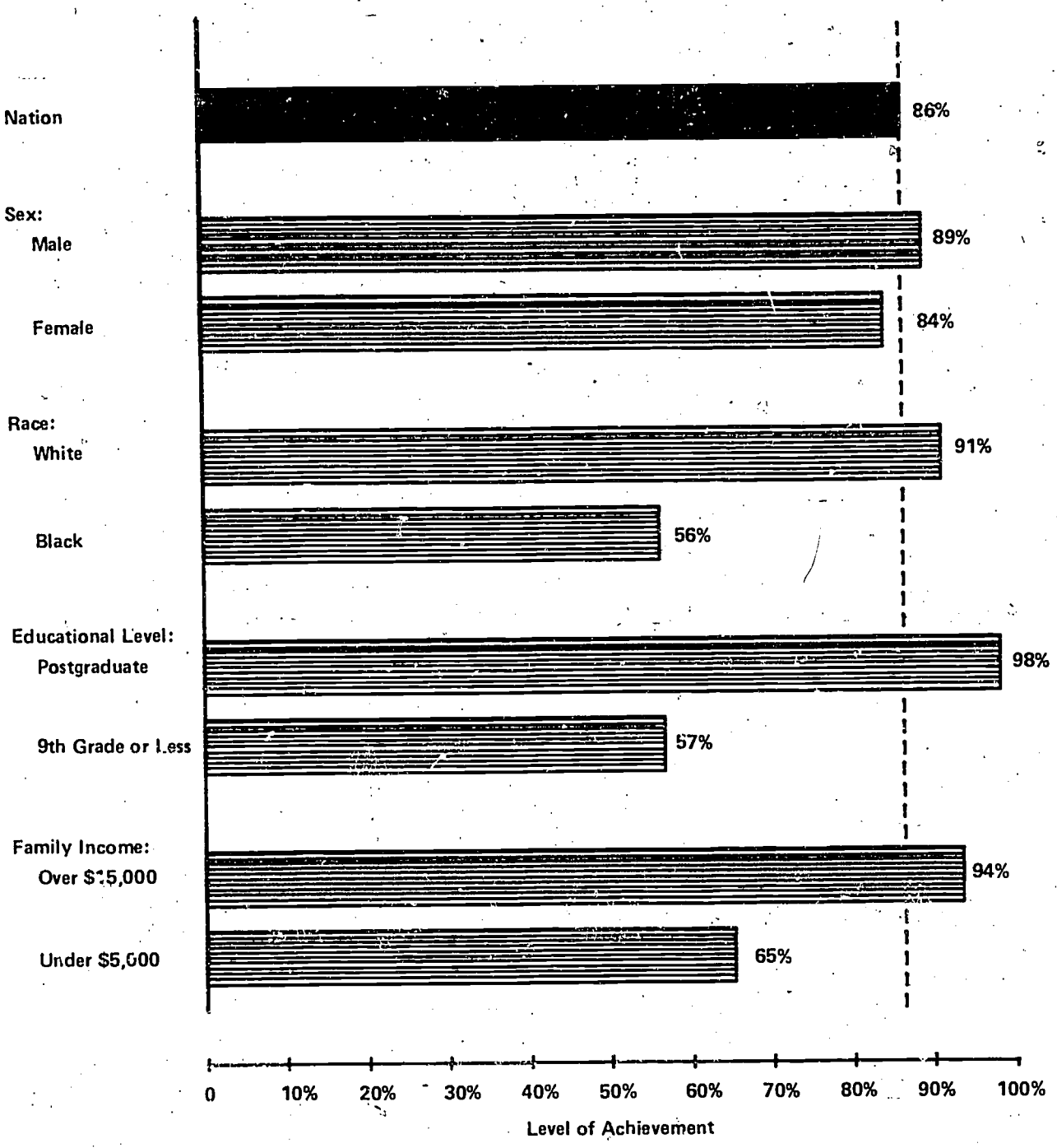
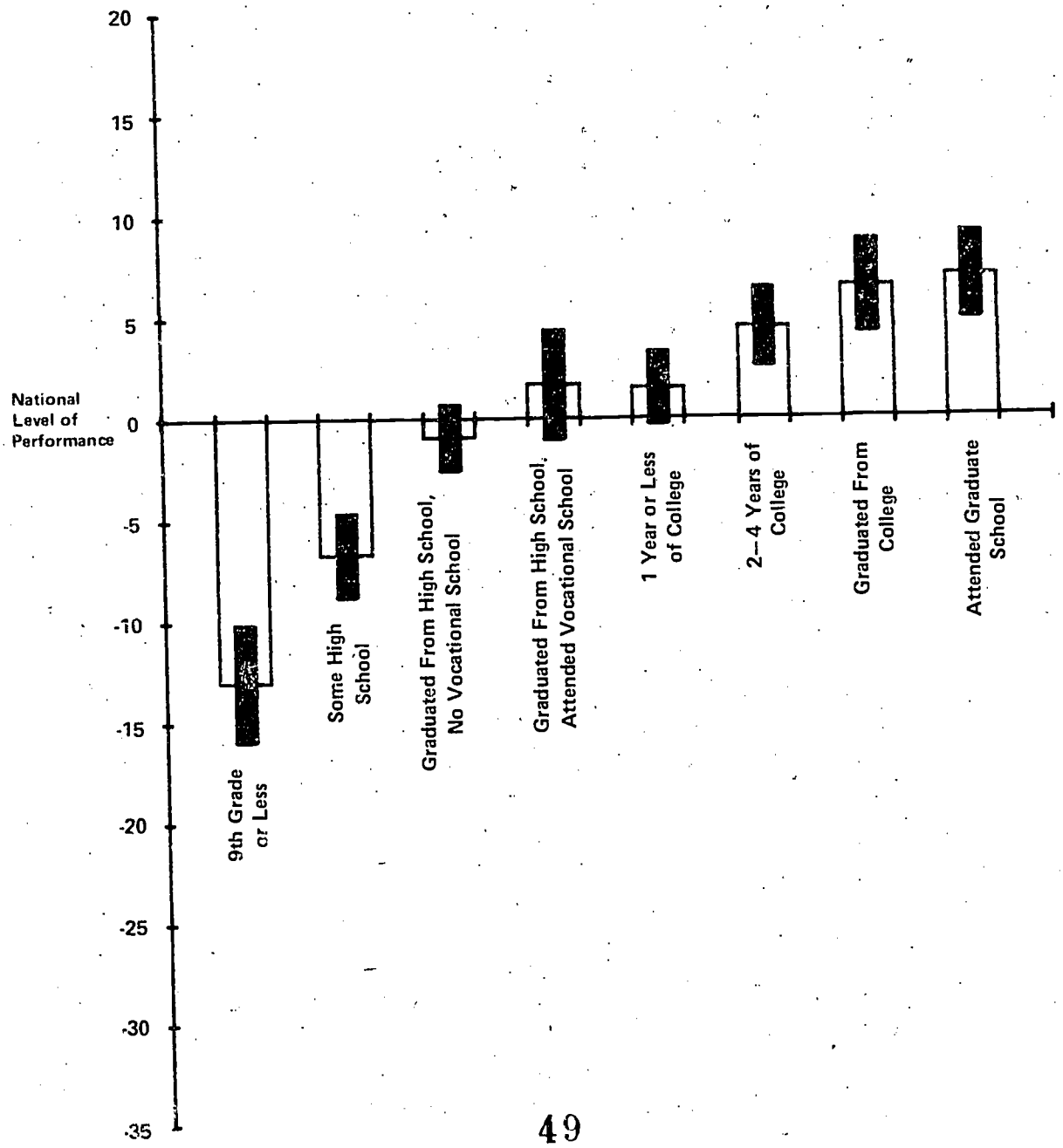


FIGURE 20. Manual and Perceptual Skills: Mean Differences From National Performance - Education



group results followed the same pattern as in other sections — a greater level of achievement at the higher education levels (see Figure 20). However, the differences among education groups were smaller for this set of items than for any of the other skills areas.

Sex

Males again did better than females on this section, outperforming them by approximately 5 percentage points. The difference in male-female results was most noticeable on two exercises involving measures of length, one asking for an estimation of length, the other for measurement of length with a ruler.

Race

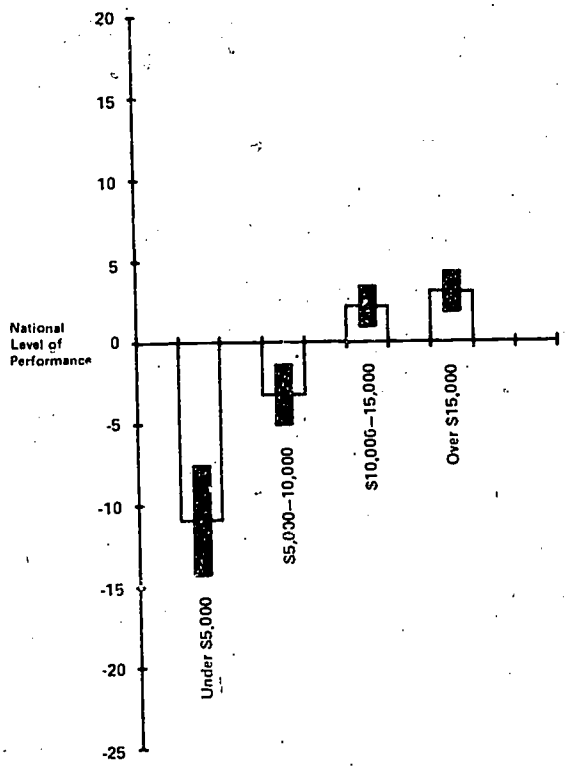
Racial group performances on these items were about as widely separated as for the written-communication area. Blacks had the most trouble, relative to the nation, in making the drawing of the objects three dimensional and in following directions on the map. Only 56% of the blacks, compared with 91% of the whites, completed the map task correctly.

Family Income

Approximately 14 percentage points separated the lowest and highest family-income groups. This difference was considerably less than for the skills areas of computation/measurement and graphic/reference materials and for the general job-knowledge area.

Figure 21 displays differences from the nation for family-income groups on these exercises. Family-income groups followed the same general pattern — higher income, higher performance — on all assessment sections surveyed. People in the lowest income group did least well on the map exercise in portraying three dimensionality; high-income people did best on these exercises.

FIGURE 21. Manual and Perceptual Skills: Mean Differences From National Performance — Family Income



CHAPTER 7

GENERAL JOB KNOWLEDGE

Success in the work world does not depend solely upon possession of a set of specific skills. A person must also recognize the values and attitudes that play a role in decisions — his/her own decisions as well as those of the employer. The items summarized in this section, entitled "General Job Knowledge," are not restricted to any particular type of job but deal with knowledge and attitudes relevant to many employment situations. Included are questions about factors to consider in career planning, attributes other than ability that may affect hiring and promotions, strategies for improving skills and attitudes toward work. Most of the items in this section are open-ended, that is, requiring a written response.

Exemplary Exercises: General Job Knowledge

One of the exercises included in the "general job-knowledge" content area dealt with things to think about in choosing a job or career. This exercise and results appear in Tables 8 and 9, Chapter 1.

A second example of an item administered as part of the general job-knowledge section is shown in Table 18. This item measures recognition of the concept of worker responsibility. To answer this item acceptably, the respondent had to state that the worker was at least in some measure responsible for his actions; 88% of the adults did so. This figure is somewhat larger than the percentage responding "yes" to part A since one could answer "no" in part A and give an acceptable answer to part B by recognizing moral responsibility but distinguishing it from other types of responsibility. These acceptable response categories were used for this exercise: (1) takes complete responsibility, (2) takes partial responsibility and (3) distinguishes moral from other responsibility. Percentages of responses in each category are also shown in Table 18.

TABLE 18. Sample Exercise and National Results: Worker Responsibility

Suppose you are a factory worker operating a machine which has a special safety shield on it. You are required to put up the safety shield whenever the machine is being used so that hot pieces of metal which come off the machine cannot hit and burn other workers. One day you are operating the machine without putting up the safety shield. A piece of hot metal flies through the air and severely burns another worker who was in a place where he wasn't supposed to be.

A. Are you responsible for the injury to the other person?	National Percentages
⬭ Yes	86%
⬭ No	9
⬭ I don't know.	6*

B. Please give me a reason for your answer.

Acceptable 88%

Category	Percentages Responding in Each Category
1. Takes complete responsibility	81%
2. Takes partial responsibility	3
3. Distinguishes moral from other responsibility	4

**Figures may not total 100% due to rounding.*

Figure 22 presents results for group differences for those giving an acceptable response (category 1, 2 or 3) to part B for variables discussed in this chapter. Male-female differences were relatively small.

One of the more difficult exercises in this section is shown in Table 19. In the most frequently given reasons that Mr. Smith might like his job, 16% gave evidence to show that he liked his job(e.g., if he did not like it, he would quit); 7% said that he might like the repetitive nature and ease of the job; 4% stated that it might be the only job that he could get; and 4% said that he might like the lack of responsibility.

TABLE 19. Sample Exercise and National Results: Mr. Smith's Job

A. Mr. Smith has a job. All day long he runs a machine that punches holes in leather belts. He does the same thing every day. Do you think it is possible that Mr. Smith likes his job?

	National Percentages
⬭ Yes	50%
⬭ No	31
⬭ I don't know.	19

B. Give a reason for your answer.

Acceptable 43%

This exercise is noteworthy because group differences on this item do not follow the usual pattern. Blacks and persons having low family incomes performed slightly better than the national average on this exercise, while whites and persons having high family incomes performed at or below national levels.

Summary of Results: General Job Knowledge

This content area was more difficult than the specific job-knowledge content area discussed in Chapter 8 and showed a wider divergence in group performances. The difficulty level may have been partly due to the format of the items, since most required a written response. The task of writing may have discouraged some respondents. Although the answers were not scored for the mechanical correctness of the writing, respondents had to complete two steps: (1) formulating responses to rather general questions and (2) writing down these responses.

Level of Personal Education

The difference for the education groups was greater on the general job-knowledge items than for any other set of exercises discussed in this report. Those with a ninth-grade education or less performed 30 percentage points below the nation, while those who had done postgraduate work performed approximately 15 percentage points above. Figure 23 shows mean differences from the nation and 95%-confidence intervals around those means for each of the eight levels of education.

Performance levels relative to the nation varied on different exercises. People at the lowest education level were closest to (although still below) the national level on the question about Mr. Smith's job (see Table 19) and farthest below the nation on two questions about planning for the future. At the two highest education levels, these results were reversed, with performance levels for Mr. Smith's job close to that of the nation and for the two planning exercises, 16 to 21 percentage points above the nation.

Family Income

Twenty-three percentage points separated the results for highest and lowest family-income groups. Figure 24 displays mean differences in

FIGURE 22. National and Selected Group Percentages of Success: Worker-Responsibility Exercise

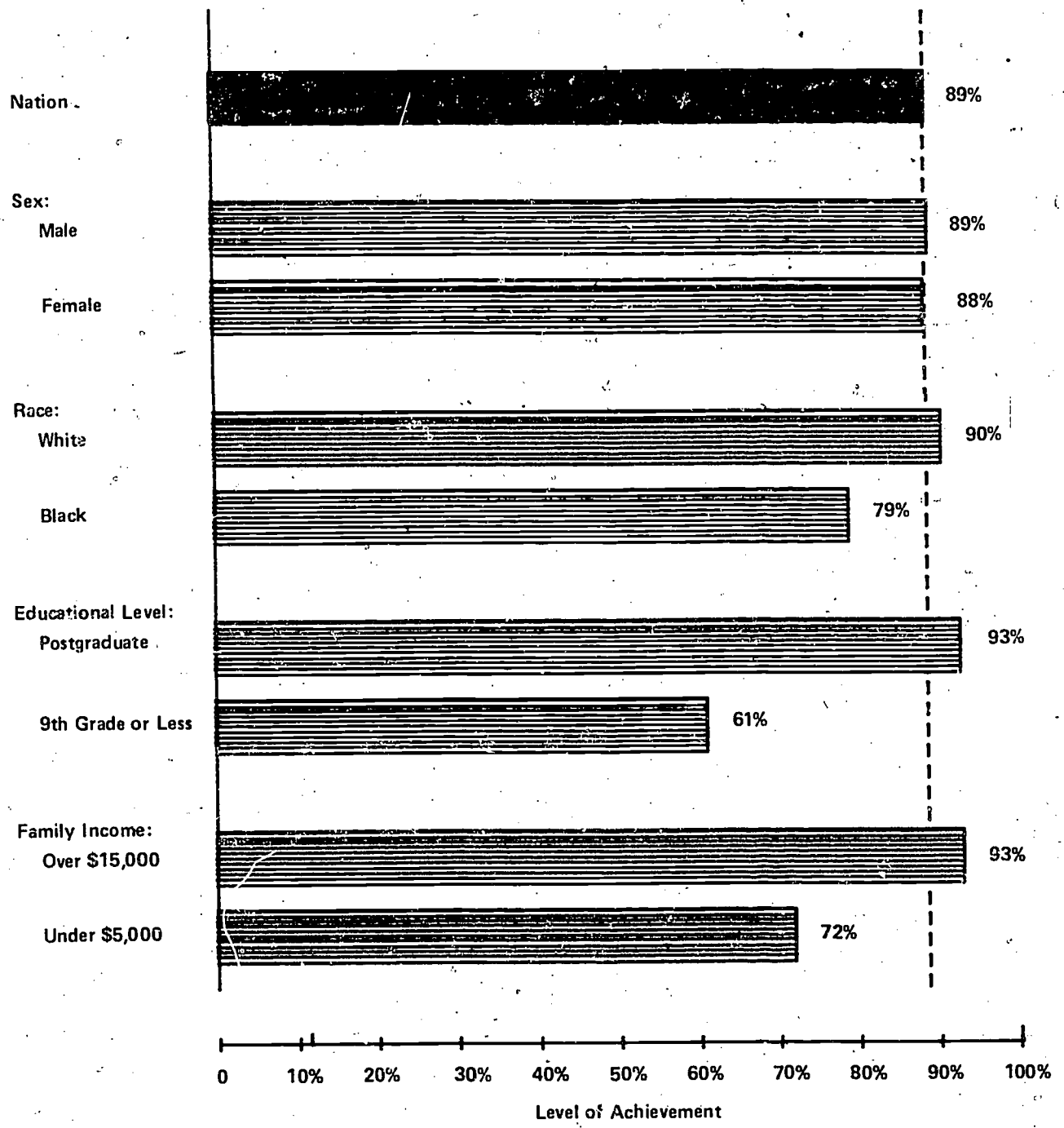
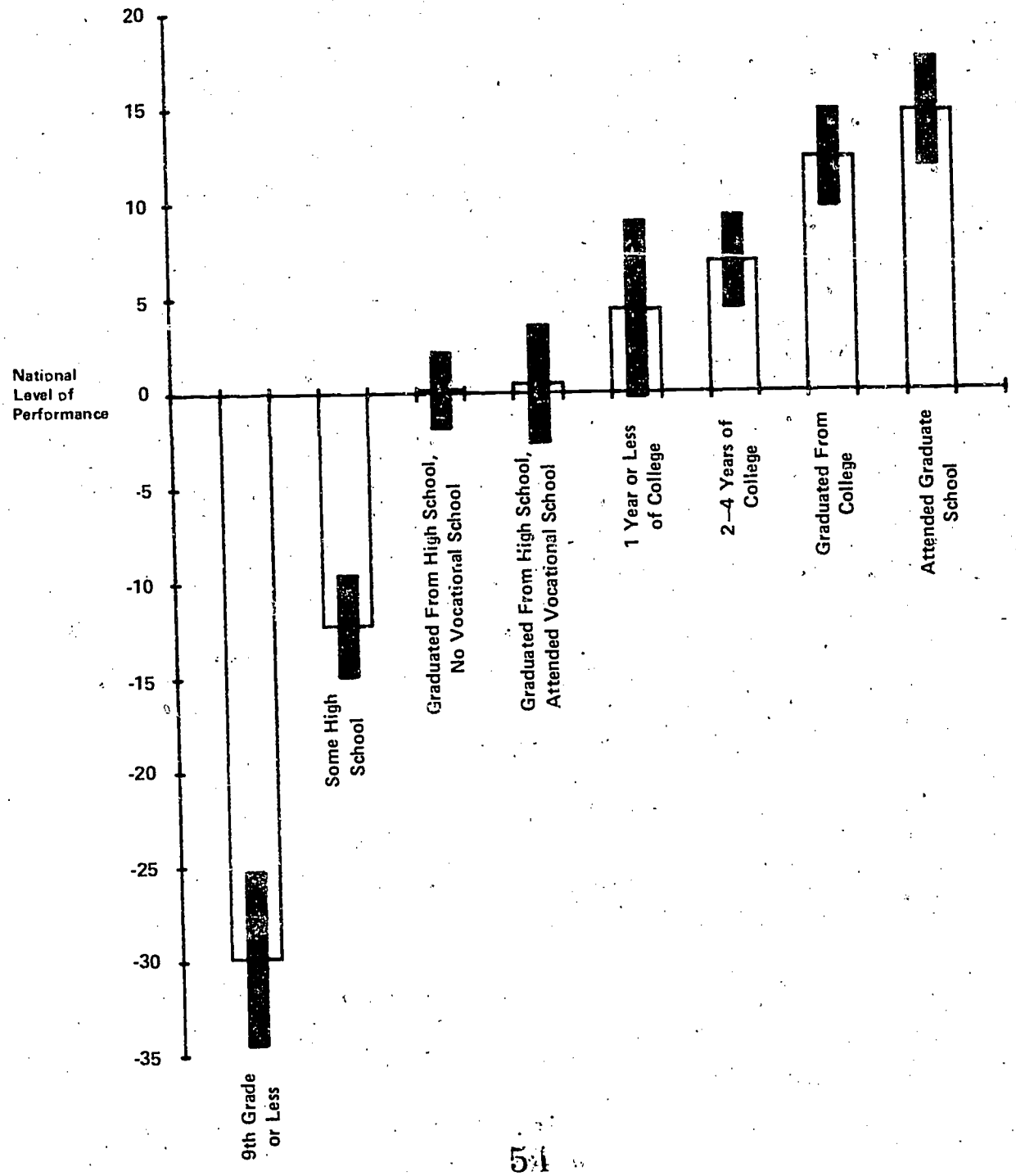


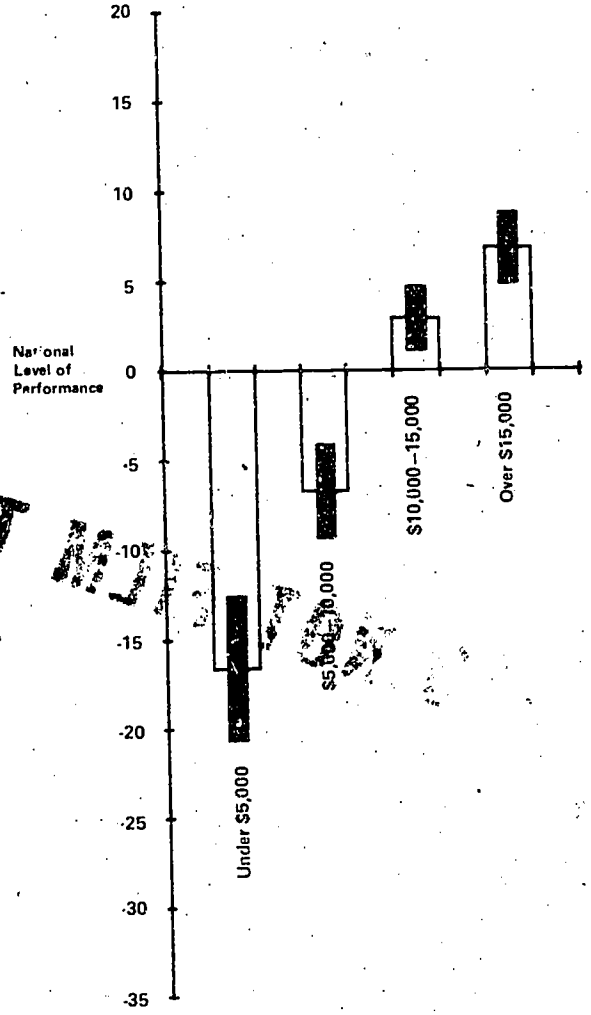
FIGURE 23. General Job Knowledge: Mean Differences From National Performance — Education



performance and confidence intervals for all family-income groups. None of the confidence intervals for family-incon roups overlap the national level of perform .

The lowest income group, like the lowest education group, tended to do best relative to the nation on the exercise about Mr. Smith's job. The lowest income grou ad considerable difficulty with the t estions concerning planning for the future mentioned in the preceding education section, with results 22 percentage points below the nation on one exercise and 32 percentage points below on the other.

FIGURE 24. General Job Knowledge: Mean Differences From National Performance — Family Income



Race

Differences in performance levels for blacks and whites amounted to an average of 18 percentage points. Performances on specific exercises were similar to that for groups previously discussed, blacks performing above the nation on the question about Mr. Smith's boring job and showing a large difference below the nation on the two questions about planning for the future. These patterns were reversed for whites.

Sex

Sex differences on these exercises were, all in all, negligible. The average difference between the two groups was not statistically significant. However, females were much more likely to answer the question about Mr. Smith's boring job acceptably (51% of the females v. 35% of the males).

CHAPTER 8

SPECIFIC JOB KNOWLEDGE

A major objective of career education is educating people about specific jobs — duties, abilities required, training needed, pay rates and so forth. Such information is necessary to make rational career decisions. Obviously, no one can know all about all possible occupations; however, the questions included in the career and occupational development assessment serve as indicators of a general level of awareness about specific jobs.

How is knowledge about specific jobs valuable for adults, most of whom have already made some career choices? First, adults, more often today than ever, are changing jobs and need a greater awareness of alternatives. Second, differences in group performances may indicate that some groups have less knowledge about occupations than others and thus may be more limited, either in their original planning and career choices or in subsequent decisions. As one example, National Assessment data show that women do less well than men on some items about traditionally masculine jobs and better than men on some items about traditionally feminine jobs.

Exemplary Exercises: Specific Job Knowledge

Following are several samples of items used in the assessment of specific job knowledge. National results and group differences for items such as these were aggregated to provide summary statistics for this section. Most of the items included in the specific job-knowledge area were multiple-choice.

Table 20 displays an exercise that measured knowledge of job duties and national results for the exercise.

TABLE 20. Sample Exercise and National Results: Duties of Automobile Repairman

Which one of the following jobs requires heavy lifting, crawling and bending?

	National Percentages
● Automobile repairman	94%
○ Salesman	0*
○ Barber	0*
○ Railroad engineer	5
○ I don't know.	1

**Rounded percents less than one.*

The percentage of success on this exercise was high; only 6% of the adults failed to identify "automobile repairman" as the correct answer. Figure 25 shows selected group performances for this item. Differences in group performances on this question were considerably smaller than for the examples shown in the general job-knowledge chapter.

Shown in Table 21 are two other sample exercises, one dealing with length of training and the other with rates of pay. Four-fifths of the adults knew that, of the occupations listed, a plumber requires the longest training period, and slightly more (85%) knew that a chemist earns most among the jobs shown. Again, different population groups showed varying levels of awareness about specific jobs (see Table 22). The differences in group performance are much more striking for the exercise about the plumber than for the exercise about the chemist, with the exception

FIGURE 25. National and Selected Group Percentages of Success:
Duties-of-Automobile-Repairman Exercise

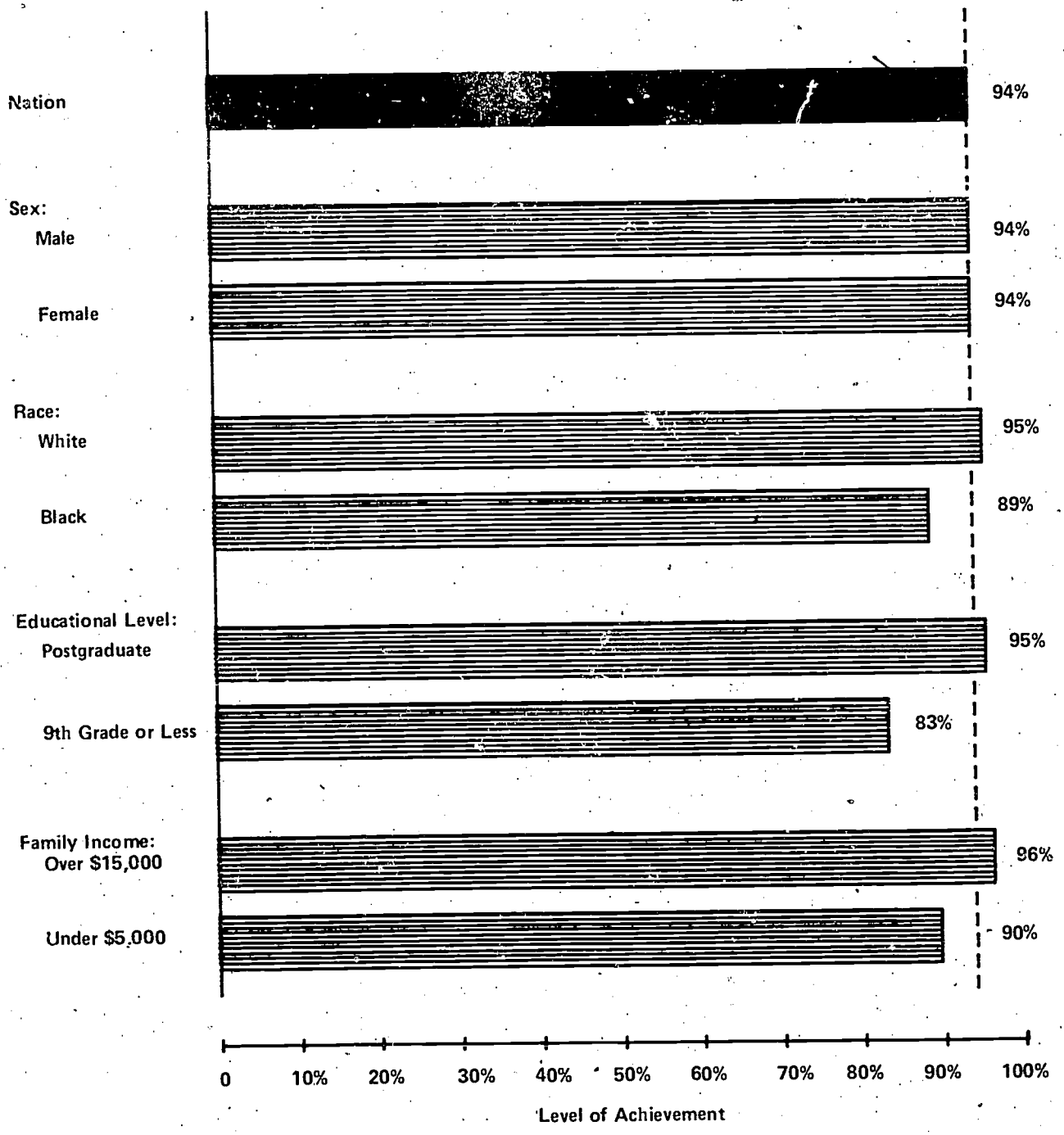


TABLE 21. Two Sample Exercises and National Results: Plumber's Training and Chemist's Salary

Plumber's Training

Which one of the following jobs usually requires the LONGEST period of training?

	National Percentages
○ Manicurist	4%
● Plumber	80
○ Assembly line worker	6
○ Truck driver	4
○ I don't know.	6

Chemist's Salary

Which person usually earns the most money?

	National Percentages
○ Elementary school teacher	3%
○ Postal clerk	2
○ Nurse	5
● Chemist	85
○ I don't know.	6*

**Figures may not total 100% due to rounding error.*

of male-female performance levels. On the exercise about the chemist, women were slightly more likely than men to cite "elementary school teacher" and "nurse"—traditionally feminine professions.

TABLE 22. Selected Group Differences From National Performance on Two Sample Exercises: Plumber's Training and Chemist's Salary

	Plumber's Training Exercise		Chemist's Salary Exercise
National	80%		85%
Sex:			
Male	1†		3*
Female	-1		-3*
Race:			
Black	-25*	**	-12*
White	4*	**	2*
Education:			
9th grade or less	-37*	**	-19*
Postgraduate	10*	**	6*
Family income:			
Under $5,000	-29*	**	-10*
Over $15,000	11*	**	5*

**Indicates significant difference from national performance.*
†Numbers indicate difference from the national percentage of success.
***Indicates significant difference in group performance on the two exercises.*

Summary of Results: Specific Job Knowledge

The average national percentage of success for the specific job-knowledge items was fairly high, perhaps in part because the items were nearly all multiple-choice and were fairly general so that they would apply to all parts of the country. Most of the items with percentages of success above the national mean for this section involved identification of jobs and job duties. Questions concerning length of training needed for a particular job, salary and union membership requirements generally proved more difficult. The visibility of the job asked about also influenced results. The duties of a secretary were much more familiar than those of a machinist; the tasks of a baker were recognized more easily than were those of an x-ray technician.

Group differences on this set of items were, for the most part, smaller than for the general job-knowledge section. The only exception was for the sex groups; they were more widely separated in performance on this section than on the previous one.

Level of Personal Education

The difference between the highest and lowest education groups amounted to 24 percentage points — those with a ninth-grade education or less averaged 67% acceptable responses, while those with graduate schooling averaged 91%. Average group differences for each level of school completed appear in Figure 26.

The differences between the various levels of education followed a slightly different pattern than for the general job-knowledge content area. For the specific job-knowledge section, a difference existed between high school graduates who had and had not attended vocational school; no difference was apparent on the general job-knowledge section.

The adults who took part in this assessment would have completed high school in the late 1950s and early 1960s. Career education was not generally an important part of the high school curriculum in that era, and some of those who did not continue their formal education beyond high school perhaps lacked the opportunity to learn about some of the occupations open to them. It will be interesting to see if performance levels change as career education becomes more and more emphasized in the secondary schools.

Some types of exercises were more difficult for adults in the two groups with less than a high school education. They tended to have results further below the nation on exercises concerning length or type of job training required than on other types of exercises. For the lowest education group (ninth-grade education or less) the mean on all specific job-knowledge exercises fell below the nation by 18 percentage points. Differences below the nation on all but one of the exercises about amount of training required were greater than this. Results for these exercises for the education group with some high school were either close to or below the group's mean difference (which was 7 percentage points below the nation); none was significantly above.

For the college graduates, results for the majority of the training exercises were above the group's mean difference from the nation, and for the graduate-school group, results for all but one of these exercises were above the group's mean difference.

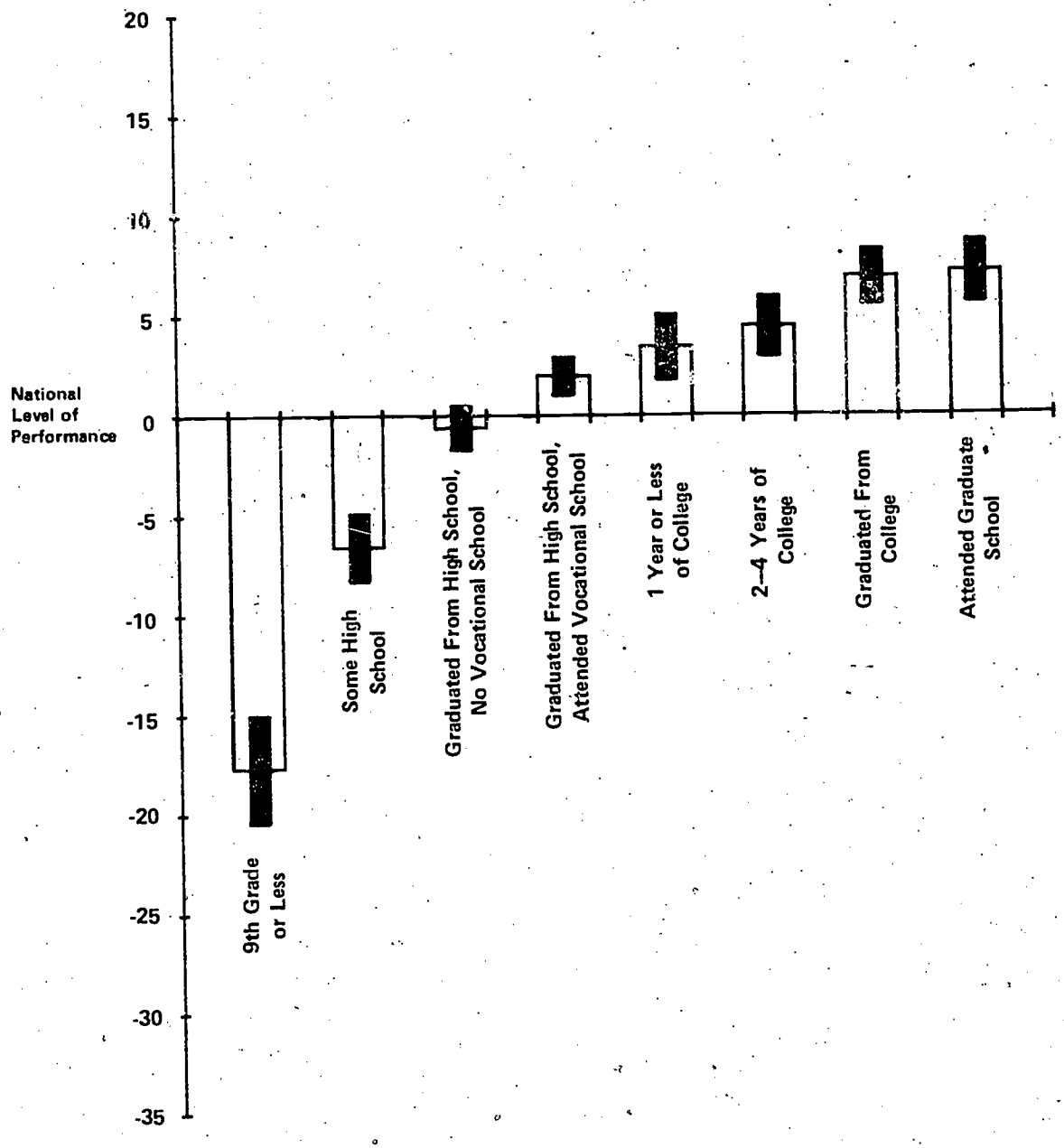
Group differences for exercises about job duties varied according to the nature and familiarity of the job. For instance, architect and travel clerk were fairly difficult for the lowest education group. All education groups tended to be close to the national level on exercises about familiar jobs such as secretary, truck driver and cook.

Sex

Results for the two sex groups showed a greater difference on this than on the previous section. The male average percentage acceptable was approximately 3 percentage points above that for females. One explanation for this difference in performance is the content of the assessment items. More of the items having correct answers involved occupations traditionally considered more masculine than feminine. The items reflect the range of occupations available in the society, and traditionally, a much wider variety of jobs has been open to men than to women. The three exercises on which women showed a significantly higher performance all involved typically female jobs — secretary, registered nurse and waitress.

The sex orientation of the jobs in the items may not have been solely responsible for the difference in performance, however. Results also varied according to the aspect of the job included in the question. For example, a number of questions asked about union membership for various jobs, and another series of items involved the length of education or training required for selected jobs. The male percentage of success was higher than that for females on both sets. Male performance on the "union" questions averaged 8 points above that for females and on the "training" questions, 5 points above that for females.

FIGURE 26. Specific Job Knowledge: Mean Differences From National Performance — Education



When the results for the questions about unions and job training are removed from the summaries for the specific job-knowledge section, male and female performance means are approximately the same.

Men and women thus have roughly equal amounts of information about job duties and salaries, at least on the items measured by the assessment, although females have an advantage on predominantly female jobs (e.g., secretary) and males on particularly masculine jobs (e.g., machinist). For occupations that were more neutral in sex orientation or more highly visible (baker, lawyer, accountant), percentages of success were about the same. However, women are somewhat at a disadvantage in some areas of specific job knowledge and might thus be handicapped in career planning.

Race

Levels of performance for the black and white adult populations differed considerably. The average percentage of success for blacks on these exercises was 72% and for whites, 86%. However, this difference is smaller on these exercises than on the general job-knowledge items, on which black performance was 18 percentage points below that of whites.

Blacks also had more difficulty with the exercises about the length of education or training required for a particular job. On these items, the black mean difference from the nation was -15, compared with -12 for all specific job-knowledge items omitting the "training and education" items.

Table 23 shows two examples of exercises on which blacks showed large and small differences from the nation.

Family Income

Figure 27 presents mean differences from national performance and 95%-confidence intervals around these means for all family-income groups. Similar to results for other variables discussed in this chapter, the lowest income group tended to have more than average difficulty with a majority of the exercises about the education or training required for a job, while the highest income group generally showed a performance further above the nation on these items than on some of the other specific job-knowledg xercises.

TABLE 23. Comparison of Black and White Performance on Two Exercises: Social Worker and Plumber's Training

Social Worker

Which person below spends the most time helping people with their personal and family problems?

- ○ Policeman
- ○ Teacher
- ● Social worker
- ○ Banker
- ○ I don't know.

White percentage of success	96%
Black percentage of success	92

Plumber's Training

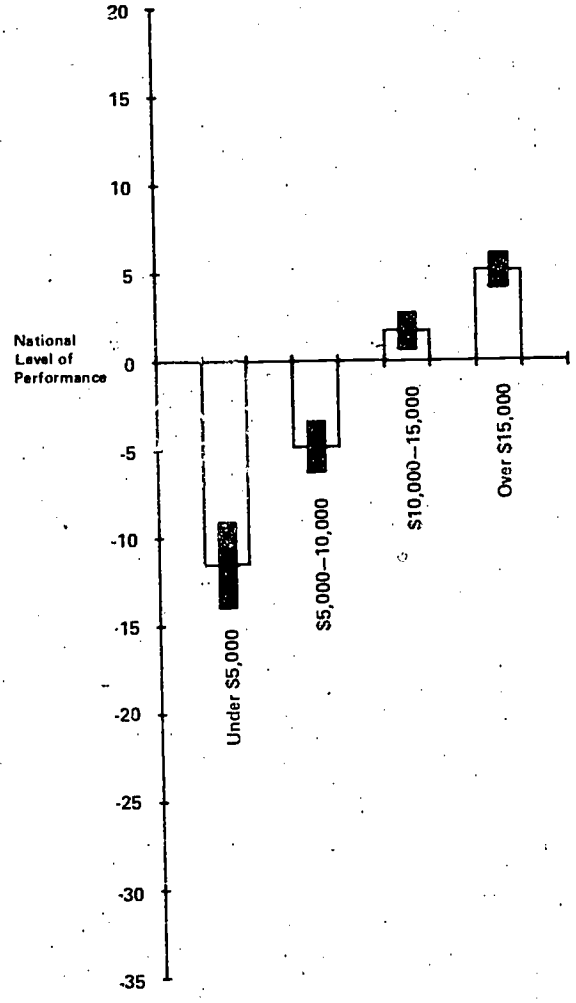
Which one of the following jobs usually requires the LONGEST period of training?

- ○ Manicurist
- ● Plumber
- ○ Assembly line worker
- ○ Truck driver
- ○ I don't know.

White percentage of success	84%
Black percentage of success	55

The consistently lower results on the exercises concerning amount of training required for specific jobs for the less advantaged groups seem to indicate that more emphasis on this area by the schools is needed. People from the more advantaged groups — high income, high level of education and the like — have acquired this knowledge somewhere; others have not. People at the lower end of the socioeconomic scale may have difficulty in evaluating their educational needs realistically.

FIGURE 27. Specific Job Knowledge: Mean Differences From National Performance — Family Income



CHAPTER 9

ADDITIONAL VARIABLES

This chapter describes results for variables for which either the results were more conclusive when aggregated over all six content areas or the patterns of response were so similar for each content area that it was not necessary to describe them in detail each time. Three of the variables concern educational factors other than the amount of formal schooling. These are: (1) participation in continuing education, (2) attendance at a tax-supported or nontax-supported high school and (3) level of parents' education. Other variables included in this chapter are region of the country and size and type of community lived in.

Continuing Education

To determine participation in continuing education, adults were asked the questions shown in Table 24. Thus, continuing education, when discussed in this report, will include on-the-job training, correspondence courses and adult education, as well as other types of continuing education. Slightly over half the young adults in the nation had participated in some type of continuing education courses; 43% of the young adults felt that the courses they had taken had helped them in their work.

We can look at the continuing-education data in two ways. First, we can examine the types of people who have and have not taken continuing-education courses. Then, we can consider the percentages of success of the people who have and have not attended continuing-education courses.

Sixty-five percent of those who had participated in job-helpful continuing-education courses had had some formal schooling beyond high school graduation; 60% of those who had taken nonjob-helpful continuing education had also attained that educational level. This is compared to only 54% of the nation as a whole who have had some formal education after high school.

TABLE 24. Continuing-Education Questions

A. Have you ever taken any courses such as correspondence courses, on-the-job training or adult education courses?

	National Percentages
○ Yes (Go to B)	55%
○ No (End the exercise)	45
○ I don't know. (d the exercise)	0*
○ No response (d the exercise)	0

B. Did one of these courses help you in your present or past work in any way?

	National Percentages
○ Yes	43
○ No	11
○ I don't know.	†
○ No response	0**

**Rounded percents less than one.*
†No continuing education group: 45%.
***Figures may not total 100% due to rounding.*

Of the different education groups, vocational-school people were most likely to have participated in continuing education, followed by those who had attended college but not graduated. Seventy-one percent of the vocational school group, 65% of those with two to four years of college and 61% of those with one year of college had participated in some type of continuing education, and 63%, 51% and 47% of these groups, respectively, had participated in job-helpful continuing education. Table 25 shows the percentages of each educational group reporting that they had had no continuing education, that they had had continuing education that was not helpful to their job and that they had had continuing education that was helpful to their job.

Those who had never attended continuing-education courses performed below the nation on all parts of the assessment discussed in this report, while those who had had any type of continuing education were above the national level. Figure 28 shows mean differences from national performance for the three levels of continuing education for the generally useful skills (computation/measurement, graphic/reference-materials, written-communication and manual/perceptual) and for the job-knowledge items (general and specific). Items are summarized in two groups because the items in the two groups are of such different content and nature that a single summary would not be as meaningful.

In every instance, those who had attended continuing-education courses that helped them in their work did slightly better than those who had participated in courses not related to their jobs. The differences in performance between extreme groups — those who had had job-helpful continuing education and those who had no continuing education — did vary on the different sections. Differences were largest on the computation/measurement, graphic/reference-materials and general job-knowledge sections and smallest for specific job-knowledge and manual/perceptual skills.

Tax-Supported v. Nontax-Supported High Schools

Adults were also questioned about the type of high school that they had attended: public, private or parochial. Approximately 82%

TABLE 25. Percentages of Each Education Group Participating in "No Continuing Education," "Continuing Education, Not Job Helpful" and "Continuing Education, Job Helpful"

	No Continuing Education	Continuing Education, Not Job Helpful	Continuing Education, Job Helpful
9th grade or less	65%	7%	22%
Some high school	57	12	28
Graduated from high school,no vocational school	50	9	38
Graduated from high school, attended vocational school	26	8	63
1 year or less of college	35	14	47
2–4 years of college	33	14	51
Graduated from college	39	11	48
Attended graduate school	38	12	46

attended public high schools, 7% parochial high schools and 3% private high schools; 8% of the adults did not attend high school. Numbers of adults attending private schools were too small to be reported separately, so private and parochial high school students were combined in a group designated "nontax-supported high schools." No significant differences in performance existed between those who had attended the two types of high schools.

Level of Parental Education

Level of performance differs with one's educational experience. Another educational variable that shows varying achievement levels is the amount of education of one's parents. This variable is perhaps more useful for school-aged children, since we do not know the level of education they will finally reach, but it provides additional insights to the performance of the young adult population.

Four categories of parental education were used: (1) neither parent had any high school education (NHS), (2) at least one parent had some high school education (SHS), (3) at least one parent graduated from high school (GHS) and (4) at least one parent had some education beyond high school (PHS).

Distribution of young adults in these four groups was fairly even. About 25% had parents with no high school education, 16% had at least one parent with some high school experience, 30% had at least one parent who graduated from high school and 25% had at least one parent with some post high school education. (Four percent did not know the level of their parents' education.)

FIGURE 28. Continuing Education: Mean Differences From National Performance – Generally Useful Skills and Job-Knowledge Exercises

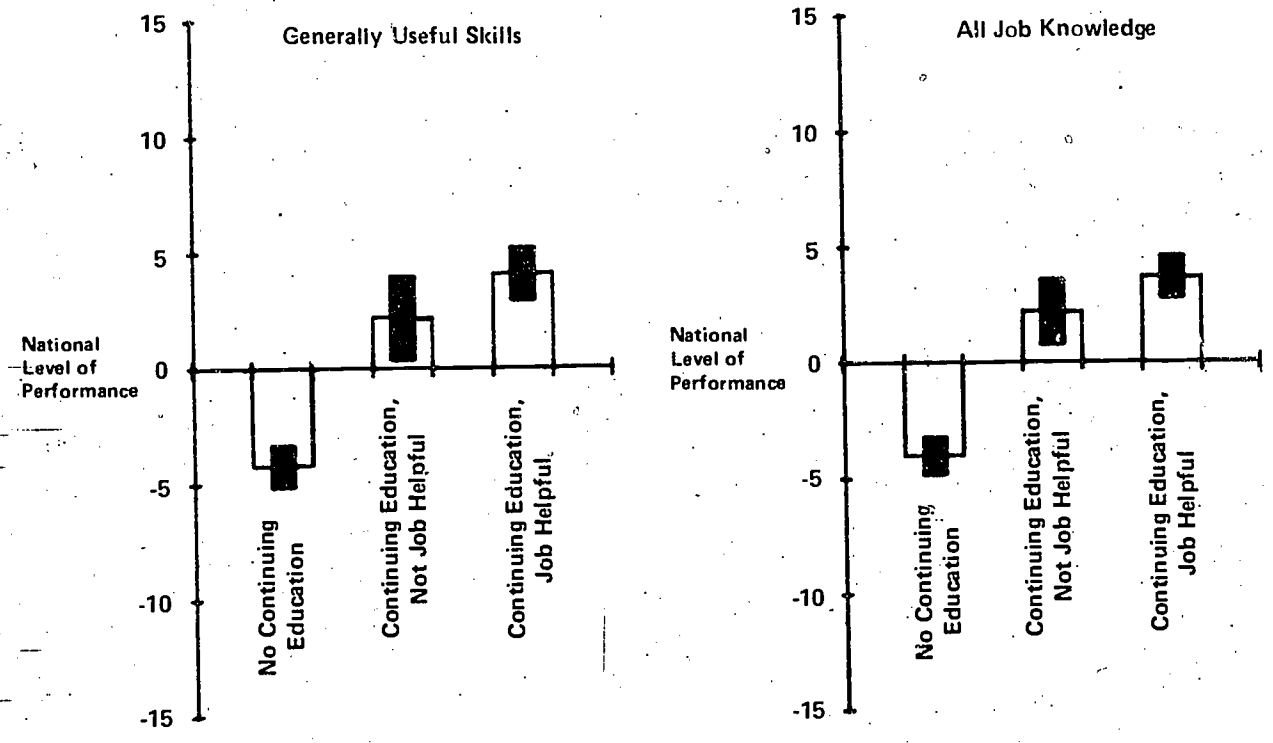


FIGURE 29. Relationship of Personal-Education and Parental-Education Variables

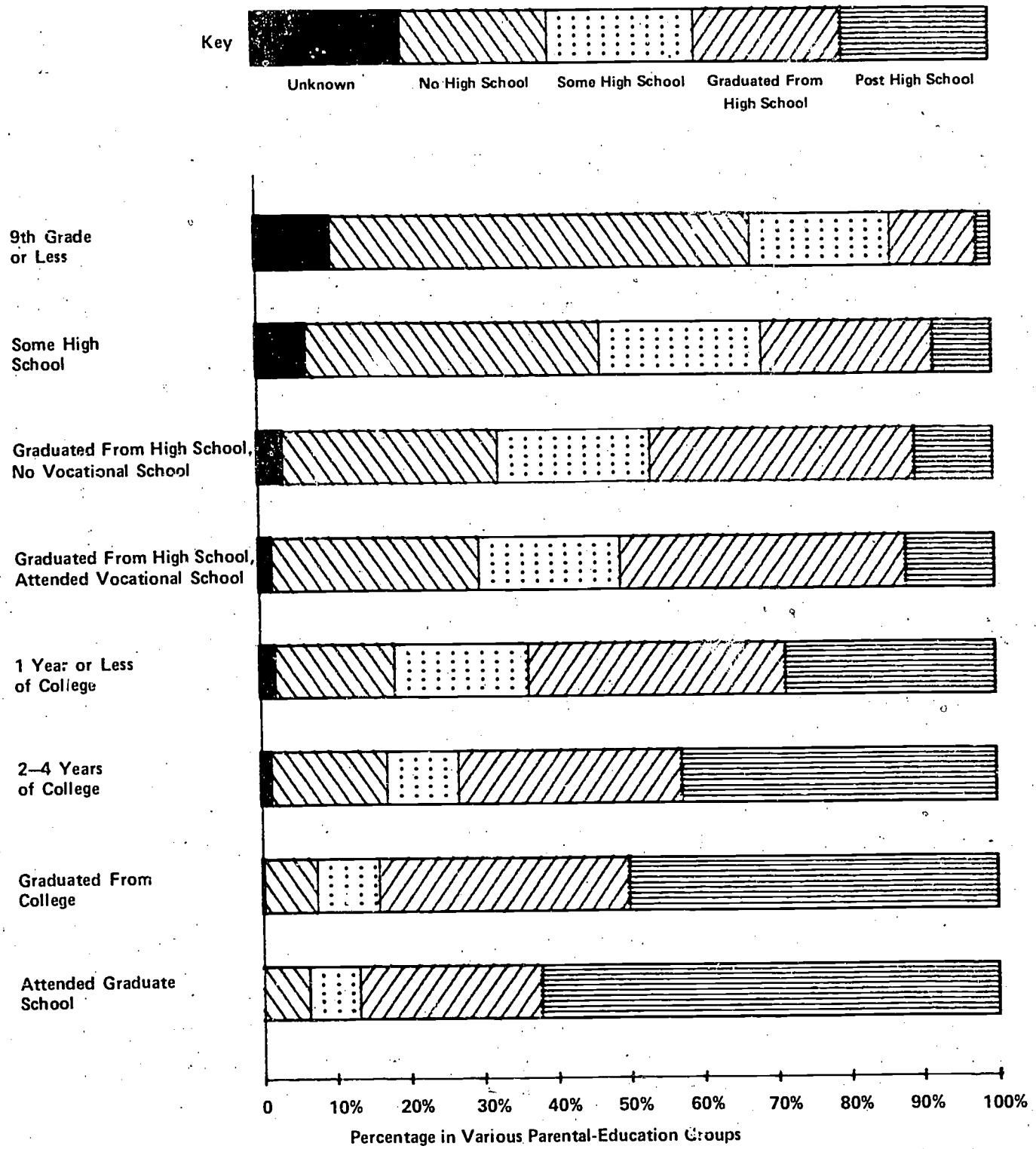


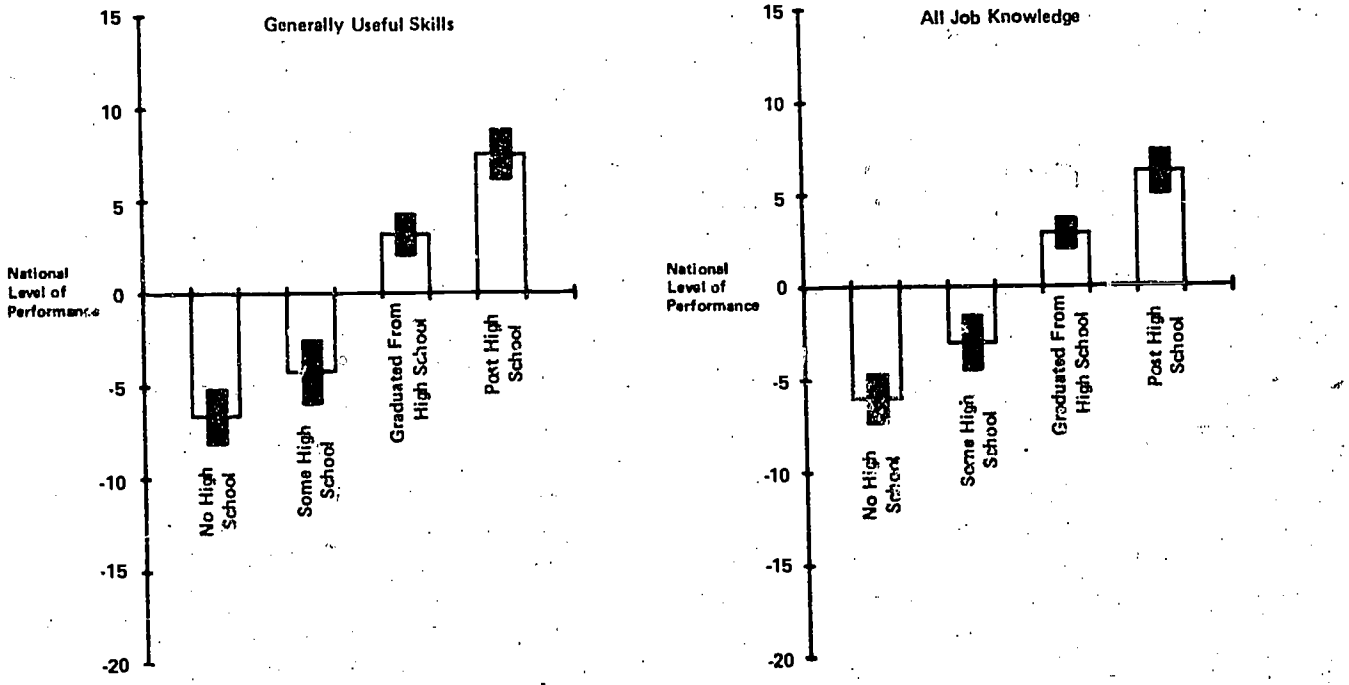
Figure 29 displays the relationship between young adult educational levels and their parents' educational achievement. In this display, each bar represents one education group. Shown on each bar is the proportion of the particular group having parents in each parental-education category. Thus, for example, 57% of those with an education of ninth grade or less had parents in the NHS group, while only 6% of those in the attended-graduate-school group did. Conversely, only 2% of those in the ninth-grade-or-less education group had parents with education beyond high school, while 62% of the attended-graduate-school group did. The proportion of people with at least one parent either having some high school or having graduated from high school remains relatively constant for all education groups; however, the proportion with parents having no high school education drops markedly as personal-education level increases, and the proportion having at least one parent with some education beyond high school increases correspondingly.

The extent of parental education was related to performance on the assessment. Persons with parents in the NHS and SHS groups always performed below the nation, while persons with parents in the GHS and PHS groups always showed results above the nation's. Figure 30 summarizes mean differences in performance for the four parental-education groups for the generally useful skills exercises and for the job-knowledge exercises.

Region of the Country

National Assessment also reports results by region of the country: Northeast, Southeast, Central and West. As has occurred in all other learning areas assessed by National Assessment, the Southeastern region of the country performed below the nation on the career and occupational development assessment. The performance of the Central region on the COD assessment was consistently above that

FIGURE 30. Parental Education: Mean Differences From National Performance — Generally Useful Skills and Job-Knowledge Exercises



of all other regional groups and above that of the nation, while respondents from the Western and Northeastern regions performed at or slightly above national levels. Figure 31 shows regional performance in terms of difference from national performance for all generally useful skills items and for all job-knowledge items.

The range of differences between highest and lowest groups was not identical for all sections of the assessment. As with other variables, the widest ranges appeared on the computation and measurement, graphic and reference-materials and general job-knowledge items.

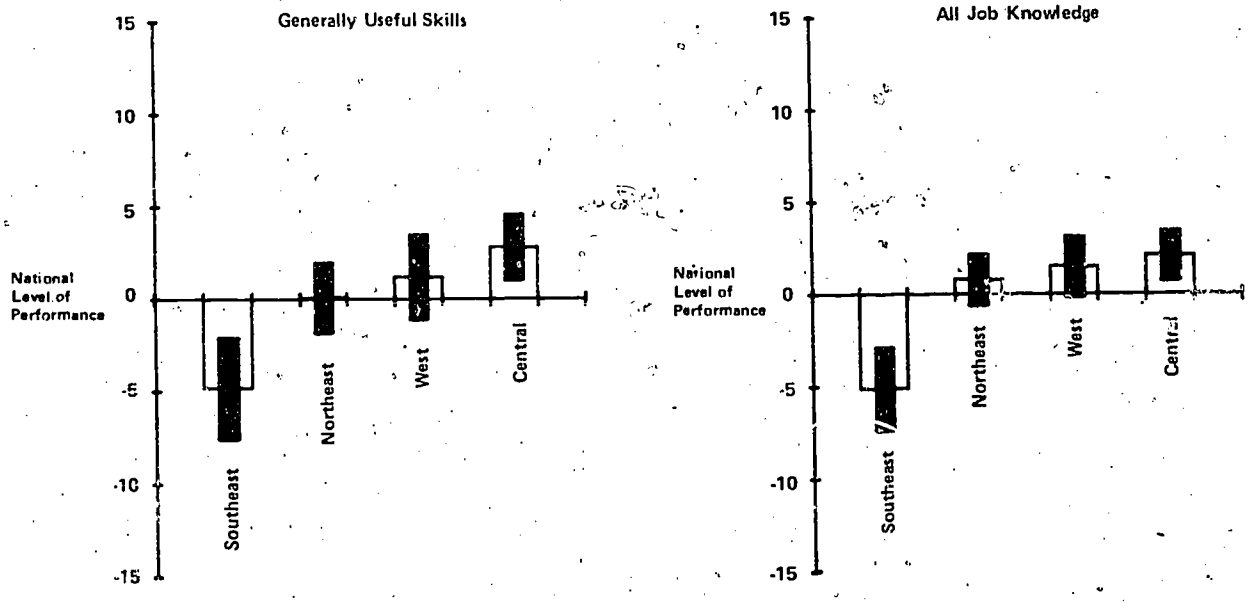
Size and Type of Community

The results for the community-type variable provide an interesting contrast to the results for the other variables discussed. For most of the other variables, groups tended to follow a regular and consistent progression from lowest to highest relative to the nation. However, only two community groups — low metro and high metro — showed consistent and sizeable differences from national performance (Figure 32). (Definitions for all size-and-type-of-community groups were given in Chapter 2.)

When results from all six content areas were considered, a fairly consistent pattern of performance for the five community types excluding high and low metropolitan emerged. The groups from the urban fringes and from small places generally showed performances above the nation, while adults from medium-sized cities and main big cities were generally below. However, these data must be viewed with some caution, since in the majority of cases, the differences from the nation were not significant at the 95%-confidence level. Thus, the only community-type groups consistently showing significant differences in performance were two urban groups, and these groups were defined by an occupational factor as well as by the size of the community.

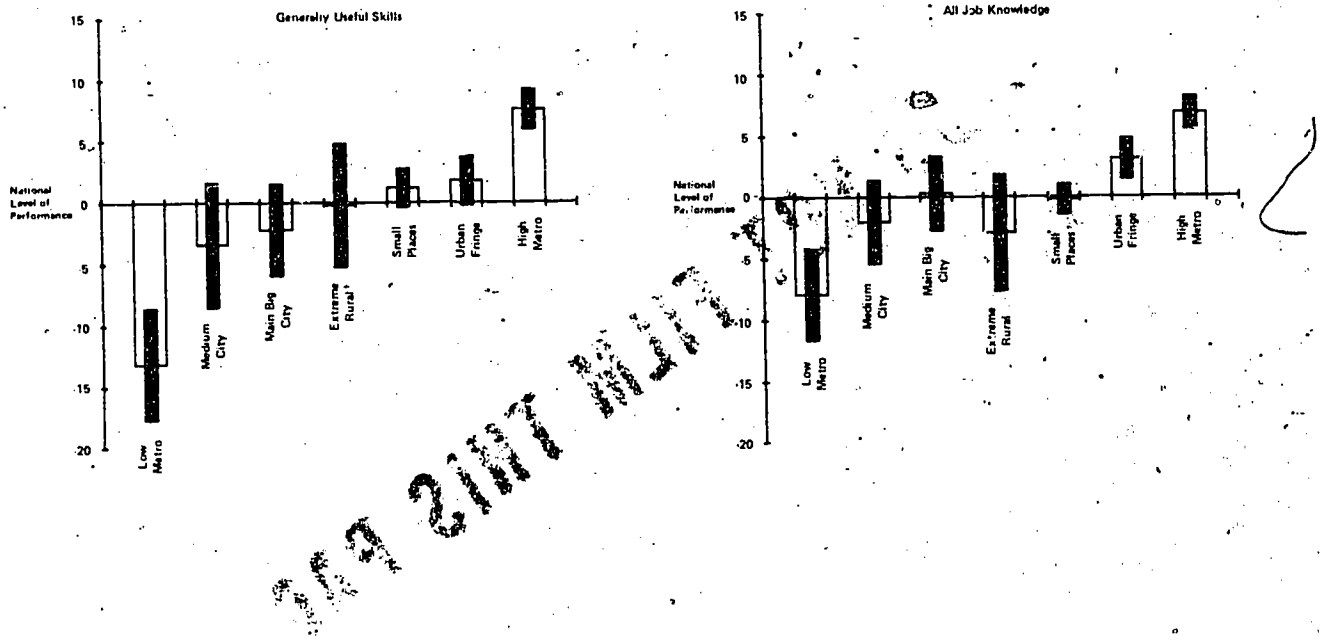
The extent of the differences between the high-metropolitan and low-metropolitan groups on the various content areas is similar

FIGURE 31. Region: Mean Differences From National Performance — Generally Useful Skills and Job-Knowledge Exercises



to that of other variables discussed in this report: largest on computation/measurement and graphic/reference-materials skills and smallest on the specific job-knowledge and manual/perceptual skills content areas.

FIGURE 32. Size and Type of Community: Mean Differences From National Performance — Generally Useful Skills and Job-Knowledge Exercises



APPENDIX A

MEAN DIFFERENCES FROM NATIONAL PERFORMANCE AND STANDARD ERRORS

TABLE A-1. General Job Knowledge: Mean Differences From National Performance and Standard Errors for Education, Sex, Race and Family Income

	P-Value	Standard Error*
Nation	68.4	0.87
	Difference From National Performance	**Standard Error of Difference**
Education		
9th grade or less	-29.8	2.28
Some high school	-12.2	1.31
Graduated from high school, no vocational school	0.2	0.97
Graduated from high school, attended vocational school	0.5	1.52
1 year or less of college	4.4	2.29
2–4 years of college	6.9	1.19
Graduated from college	12.3	1.24
Attended graduate school	14.7	1.39
Sex		
Male	-0.3	0.63
Female	0.3	0.59
Race		
Black	-15.0	2.33
White	2.5	0.37
Annual family income		
Under $5,000	-16.6	2.00
$5,000–10,000	-6.7	1.26
$10,000–15,000	2.9	0.85
Over $15,000	6.8	0.96

**Refer to Chapter 2, p. 16, for information on standard errors.*

TABLE A-2. Specific Job Knowledge: Mean Differences From National Performance and Standard Errors for Education, Sex, Race and Family Income

	P-Value	Standard Error
Nation	84.3	0.45
	Difference From National Performance	**Standard Error of Difference**
Education		
9th grade or less	-17.6	1.33
Some high school	-6.5	0.82
Graduated from high school, no vocational school	-0.5	0.53
Graduated from high school, attended vocational school	2.0	0.45
1 year or less of college	3.3	0.79
2–4 years of college	4.5	0.73
Graduated from college	7.0	0.67
Attended graduate school	7.2	0.75
Sex		
Male	1.6	0.31
Female	-1.4	0.28
Race		
Black	-12.5	1.39
White	1.9	0.26
Annual family income		
Under $5,000	-11.5	1.18
$5,000–10,000	-4.8	0.69
$10,000–15,000	1.6	0.49
Over $15,000	5.1	0.46

TABLE A-3. Computation and Measurement Skills: Mean Differences From National Performance and Standard Errors for Education, Sex, Race and Family Income

	P-Value	Standard Error
Nation	73.4	0.68
	Difference From National Performance	**Standard Error of Difference**
Education		
9th grade or less	-22.8	1.53
Some high school	-10.9	1.21
Graduated from high school, no vocational school	-1.7	0.94
Graduated from high school, attended vocational school	2.3	1.04
1 year or less of college	2.6	1.15
2–4 years of college	7.7	1.05
Graduated from college	10.8	0.77
Attended graduate school	12.4	0.95
Sex		
Male	3.8	0.42
Female	-3.5	0.36
Race		
Black	-20.2	1.92
White	3.1	0.41
Annual family income		
Under $5,000	-17.7	1.77
$5,000–10,000	-5.4	1.04
$10,000–15,000	2.1	0.60
Over $15,000	6.6	0.65

TABLE A-4. Graphic and Reference-Materials Skills: Mean Differences From National Performance and Standard Errors for Education, Sex, Race and Family Income

	P-Value	Standard Error
Nation	82.6	0.67
	Difference From National Performance	**Standard Error of Difference**
Education		
9th grade or less	-24.3	1.71
Some high school	-9.7	1.08
Graduated from high school, no vocational school	0.0	0.87
Graduated from high school, attended vocational school	1.6	0.94
1 year or less of college	3.8	1.32
2–4 years of college	6.5	0.95
Graduated from college	9.3	0.81
Attended graduate school	10.3	0.78
Sex		
Male	0.7	0.44
Female	-0.6	0.40
Race		
Black	-19.7	2.22
White	2.9	0.40
Annual family income		
Under $5,000	-18.3	1.76
$5,000–10,000	-4.9	1.13
$10,000–15,000	2.0	0.69
Over $15,000	6.7	0.58

TABLE A-5. Written-Communication Skills: Mean Differences From National Performance and Standard Errors for Education, Sex, Race and Family Income

	P-Value	Standard Error
Nation	65.5	0.68
	Difference From National Performance	**Standard Error of Difference**
Education		
9th grade or less	-25.7	2.07
Some high school	-9.5	1.27
Graduated from high school, no vocational school	-0.1	0.95
Graduated from high school, attended vocational school	1.1	1.00
1 year or less of college	4.8	1.04
2–4 years of college	5.1	1.01
Graduated from college	9.2	1.28
Attended graduate school	11.2	1.03
Sex		
Male	-3.0	0.40
Female	2.8	0.39
Race		
Black	-12.3	2.26
White	2.0	0.33
Annual family income		
Under $5,000	-11.9	1.62
$5,000–10,000	-4.9	1.25
$10,000–15,000	2.0	0.73
Over $15,000	5.0	0.78

TABLE A-6. Manual and Perceptual Skills: Mean Differences From National Performance and Standard Errors for Education, Sex, Race and Family Income

	P-Value	Standard Error
Nation	81.1	0.55
	Difference From National Performance	**Standard Error of Difference**
Education		
9th grade or less	-20.1	1.43
Some high school	-7.7	1.01
Graduated from high school, no vocational school	-0.4	0.79
Graduated from high school, attended vocational school	1.7	1.33
1 year or less of college	3.5	0.87
2–4 years of college	5.0	0.95
Graduated from college	8.0	1.12
Attended graduate school	8.7	1.04
Sex		
Male	1.2	0.38
Female	-1.1	0.34
Race		
Black	-13.0	2.15
White	2.0	0.33
Annual family income		
Under $5,000	-12.5	1.65
$5,000–10,000	-5.2	0.89
$10,000–15,000	1.9	0.59
Over $15,000	5.5	0.59

TABLE A-7. All Job Knowledge: Mean Differences From National Performance and Standard Errors for Continuing Education, Type of High School Attended, Parental Education, Region of the Country and Size and Type of Community

	P-Value	Standard Error
Nation	.91	0.48
	Difference From National Performance	Standard Error of Difference
Continuing education		
No continuing education	-4.0	0.38
Continuing education, not job helpful	2.2	0.68
Continuing education, job helpful	3.7	0.43
Tax- v. nontax-supported school		
Did not attend high school	-21.0	1.61
Attended tax-supported high school	1.7	0.31
Attended nontax-supported high school	3.4	0.90
Parental education		
No high school	-6.0	0.63
Some high school	-3.0	0.70
Graduated from high school	2.9	0.39
Post high school	6.2	0.56
Region of the country		
Southeast	-5.1	1.10
Northeast	0.8	0.67
Central	2.1	0.66
West	1.5	0.80
Size and type of community		
Low metro	-7.9	1.82
Medium city	-2.0	1.67
Main big city	0.3	1.48
Extreme rural	-2.9	2.35
Small places	-0.2	0.59
Urban fringe	3.1	0.80
High metro	6.8	0.64

TABLE A-8. Generally Useful Skills: Mean Differences From National Performance and Standard Errors for Continuing Education, Type of High School Attended, Parental Education, Region of the Country and Size and Type of Community

	P-Value	Standard Error
Nation	72.6	0.63
	Difference From National Performance	**Standard Error of Difference**
Continuing education		
No continuing education	-4.2	0.43
Continuing education, not job helpful	2.2	0.88
Continuing education, job helpful	4.1	0.54
Tax- v. nontax-supported school		
Did not attend high school	-24.5	1.61
Attended tax-supported high school	2.1	0.35
Attended nontax-supported high school	3.3	1.02
Parental education		
No high school	-6.6	0.70
Some high school	-4.2	0.83
Graduated from high school	3.2	0.53
Post high school	7.5	0.64
Region of the country		
Southeast	-4.8	1.35
Northeast	0.1	0.93
Central	2.8	0.87
West	1.2	1.13
Size and type of community		
Low metro	-13.1	2.26
Medium city	-3.4	2.51
Main big city	-2.2	1.85
Extreme rural	-0.2	2.50
Small places	1.2	0.76
Urban fringe	1.8	0.99
High metro	7.6	0.79

* U.S. Government Printing Office: 1976-679-572/478 Region 8