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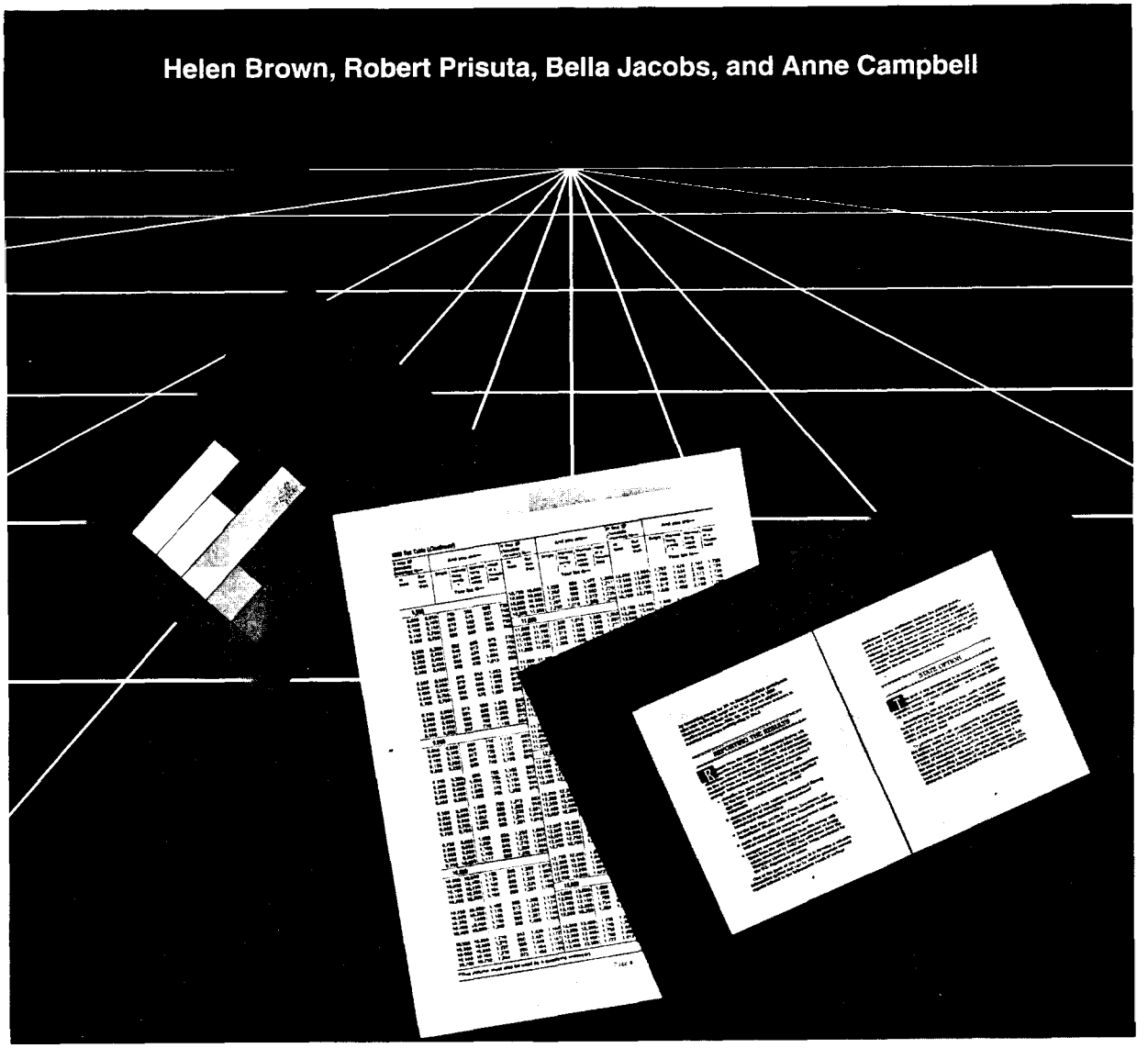
Literacy of Older Adults in America

Results from the National Adult Literacy Survey

Helen Brown, Robert Prisuta, Bella Jacobs, and Anne Campbell



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Suggested Citation
U.S. Department of Education. National Center for Education Statistics. *Literacy of Older Adults in America: Results from the National Adult Literacy Survey,* NCES 97–576, by Helen Brown, Robert Prisuta, Bella Jacobs, and Anne Campbell. Washington, DC: 1996.

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The work upon which this publication is based was performed for the National Center for Education Statistics, Office of Educational Research and Improvement, by Educational Testing Service.

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CONTENTS

Acknowledgments v
Preface vii
Executive Summary xi

Introduction 1
Defining and Measuring Literacy 2
Conducting the Survey 5
Reporting the Results 8
About This Report 12
A Note on Interpretations 13

Chapter 1: Literacy in the Older Adult Population 15
Assessing Literacy 15
Literacy Proficiencies in the Older Adult Population Overall 16
Differences illiteracy Proficiencies
Within the Older Adult Population 19
Comparing the Literacy Proficiencies of
Older and Younger Adults 21
Comparing Demonstrated and
Self-reported Literacy Proficiencies 23
Help with Literacy 26
Summary 30

Chapter 2: Literacy Profiles for Various Subgroups
of the Older Adult Population 31
Level of Education 31
Comparing levels of education among
older and younger adults 32
Comparing literacy proficiencies by level of education 34
Analyzing the relationship between literacy and
level of education 36
Reasons for leaving school 38
Race/ethnicity 40

Racial/ethnic differences in self-reported literacy proficiencies. 42
Race/ethnicity and level of education 45
Language Use 47
Visual Impairment 50
Sex 52
Sex differences in self-reported literacy proficiencies. 54
Region 56
Summary 57

Chapter 3: Employment, Civic Participation, and Economic Status as They Relate to Literacy in the Older Adult Population 59
Retirement and Labor Force Participation 59
Civic Participation 64
Volunteer activity 64
Voting. 66
Annual Household Income... 67
Level of education and annual household income 71
Race and annual household income 73
Sex and annual household income 75
Summary 77

Chapter 4: Literacy Practices and Proficiencies in the Older Adult Population 79
Acquisition of Literacy Skills 79
Library Use 83
Newspaper Reading 85
Magazine Reading 87
Sources of Information about Current Events 88
Television Viewing g 91
Personal Literacy Activities.. 93
Work-related Literacy Activities 96
Summary 99

Appendices
Appendix A: Interpreting the Literacy Scales 101
Appendix B: Additional Tables. 145
Appendix C: Overview of Procedures 157
Appendix D: Definitions of Subpopulations and Variables 175
Appendix E: Participants/Information About the Authors 183

ACKNOWLEDGMENTS

We extend our appreciation to the many individuals who contributed to the project and helped create this report on literacy in the older adult population. Thanks are especially due the members of the Literacy Definition Committee, the Technical Review Committee, the Literacy of Incarcerated Adults Review Group, and the Literacy of Older Adults Review Group. The members of these committees, listed in Appendix E, guided the project from beginning to end.

The National Adult Literacy Survey was a cooperative effort planned by the National Center for Education Statistics and the Division of Adult Education and Literacy of the U.S. Department of Education. Emerson Elliot, commissioner, provided consistent support and guidance. Andrew Kolstad, the project monitor, conscientiously guided the project and provided careful reviews of deliverables. Gary Phillips, Sue Ahmed, Joan Seamon, and Ron Pugsley also played crucial roles.

Thanks are due our colleagues at Westat, Inc., for their outstanding work in managing the complex sampling, data collection, and composite weighting processes for the survey We especially wish to acknowledge project director Martha Berlin, senior statistician Joe Waksberg, statisticians Leyla Mohadjer and Jim Green, field director Sue Rieger, and field managers Rich Hilpert, Merle Klein, Judy Meader, and Cindy Randall. The hundreds of field supervisors and interviewers who carried out the survey deserve special thanks for their efforts. We are grateful to Renee Slobasky, senior vice president of Westat, for her continuing support.

At Educational Testing Service, Irwin Kirsch directed the National Adult Literacy Survey. Sam Messick served as corporate officer. Doug Rhodes coordinated the State Adult Literacy Survey project as well as printing and shipping operations for the national survey, assisted by Cathy Shaughnessy. Jules Goodison provided senior guidance and support, particularly in the operations process, and we are grateful to him for his many contributions. We would also like to express our appreciation to Dave Hobson for his sense in financial and other matters. Mary Michaels coordinated the committee meetings, the publication of the assessment framework booklet and other aspects of the project, ensuring that the work proceeded smoothly.

Our thanks go to those who carried out the operations work — in particular Debbie Giannacio, who coordinated the receipt of the survey

materials, follow-up activities, and quality control. She was assisted by Kathy Miller, who also provided administrative support for the project. We acknowledge the contributions of Joanne Antonoff, who helped prepare the NALS proposal and whose memory we cherish. Beverly Cisney provided invaluable assistance in word processing and desktop publishing.

Don Rock and Kentaro Yamamoto of Educational Testing Service directed statistical and psychometric activities and provided guidance on technical matters. Robert Mislevy helped us reflect on statistical as well as philosophical questions, and Charlie Lewis, Neal Thomas, and Ming-Mei Wang were available for statistical advice.

Norma Norris deserves special honors for conducting the statistical work and managing the data analyses under impossibly tight deadlines. Her support went above and beyond the call of duty, and we are grateful for her dedication. Jim Ferris, Dave Freund, Tom Jirele, Bruce Kaplan, Jennifer Nelson, Inge Novatkoski, Kate Pashley, and Lois Worthington shared responsibility for conducting the data analyses. Thanks to John Barone for helping to oversee data analysis activities.

As this report took shape, many reviewers asked questions and provided insights that helped us sharpen our thinking and writing. We thank them all for their helpful comments.

Lynn Jenkins edited the manuscript and guided it through the final stages to publication. The design for the NALS reports was created by Robin Matlack of the ETS Publications Division.

Finally, we wish to thank the thousands of adults across the country who gave their time to respond to the survey. Without their participation, this study would not have been possible.

Helen Brown
Bob Prisuta
Bells Jacobs
Anne Campbell

PREFACE

The United States has always been a mosaic of cultures, but the diversity of our population has increased by striking proportions in recent years. As Barbara Everitt Bryant, former director of the Bureau of the Census, has written: "If you gave America a face in 1990, it would have shown the first sign of wrinkles [and] it would have been full of color."[1] The median age of Americans continues to rise, growing from 30 to almost 33 years during the 1980s. It is projected that by the year 2080, nearly 25 percent of the adults in this nation will be over 65, compared with only about 12 percent today. The racial and ethnic composition of the nation also continues to change. While 3.7 million people of Asian or Pacific Islander origin were living in this country in 1980, there were 7.2 million a decade later — an increase of almost 100 percent. The number of individuals of Hispanic origin also rose dramatically over this time period, from roughly 6 to 9 percent of the population, or to more than 22 million people. Our increasing diversity can not only be seen but also be heard: today, some 32 million individuals in the United States speak a language other than English, and these languages range from Spanish and Chinese to Yupik and Mon-Khmer.[2]

Given these patterns and changes, this is an opportune time to explore the literacy skills of adults in this nation. In 1988, the U.S. Congress called on the Department of Education to support a national literacy survey of America's adults. While recent studies funded by the federal government explored the literacy of young adults and job seekers, the National Adult Literacy Survey is the first to provide accurate and detailed information on the skills of the adult population as a whole — information that, to this point, has been unavailable.

Perhaps never before have so many people from so many different sectors of society been concerned about adult literacy. Numerous reports published in

[1] B.E. Bryant. (1991). "The Changing Face of the United States." *The World Almanac and Book of Facts, 1991.* New York, NY: Pharos Books. p. 72.

[2] United States Department of Commerce. (April 1993). "Number of Non-English Language Speaking Americans Up Sharply in 1980s, Census Bureau Says." *United States Department of Commerce News.*

the last decade — including *A Nation at Risk*, *The Bottom Line*, *The Subtle Danger*, *Literacy: Profiles of America's Young Adults*, *Jump Start: The Federal Role in Adult Education*, *Workforce 2000*, *America's Choice: High Skills or Low Wages*, and *Beyond the School Doom* — have provided evidence that a large portion of our population lacks adequate literacy skills and have intensified the debate over how this problem should be addressed.

Concerns about literacy are not new. In fact, throughout our nation's history there have been periods when the literacy skills of the population were judged inadequate. Yet, the nature of these concerns has changed radically over time. In the past, the lack of ability to read and use printed materials was seen primarily as an individual problem, with implications for a person's job opportunities, educational goals, sense of fulfillment, and participation in society. Now, however, it is increasingly viewed as a national problem, with implications that reach far beyond the individual. Concerns about the human costs of limited literacy have, in a sense, been overshadowed by concerns about the economic and social costs

Although Americans today are, on the whole, better educated and more literate than any who preceded them, many employers say they are unable to find enough workers with the reading, writing, mathematical, and other competencies required in the workplace. Changing economic, demographic, and labor-market forces may exacerbate the problem in the future. As a recent study by the American Society for Training and Development concluded, " These forces are creating a human capital deficit that threatens U.S. competitiveness and acts as a barrier to individual opportunities for all Americans."[3]

Whether future jobs will have greater literacy requirements than today's jobs, or whether the gap between the nation's literacy resources and its needs will widen, are open questions. The evidence to support such predictions is scarce. What many believe, however, is that our current systems of education and training are inadequate to ensure individual opportunities, improve economic productivity, or strengthen our nation's competitiveness in the global marketplace.

There is widespread agreement that we as a nation must respond to the literacy challenge, not only to preserve our economic vitality but also to ensure that every individual has a full range of opportunities for personal fulfillment and participation in society. At the historic education summit in Charlottesville, Virginia, the nation's governors — including then-Governor Clinton — met with then-President Bush to establish a set of national education goals that would guide this country into the twenty-first century. As adopted in 1990 by members of the National Governors' Association, one of the six goals states:

[3] A. P. Carnevale, L. J. Gainer, A. S. Meltzer, and S. L. Holland. (October 1988). "Workplace Basics: The Skills Employers Want." *Training and Development Journal*. pp. 20-30.

By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

The following year, Congress passed the National Literacv Act of 1991, the purpose of which is "to enhance the literacy and basic skills of adults, to ensure that all adults in the United States acquire the basic skills necessarv to function effectively and achieve the greatest possible opportunity in their work and in their lives, and to strengthen and coordinate adult literacy programs. "

But how should these ambitious goals be pursued? In the past, whenever the population's skills were called into question, critics generally focused on the educational system and insisted that school reforms were necessary if the nation were to escape serious social and economic consequences. Today, however, many of those who need to improve their literacy skills have already left school. In fact, it is estimated that almost 80 percent of the work force for the year 2000 is already employed. Moreover, many of those who demonstrate limited literacy skills do not perceive that they have a problem. Clearly, then, the schools alone cannot strengthen the abilities of present and future employees and of the population as a whole. A broad-based response seems necessary.

To initiate such a response, we need more than localized reports or anecdotal information from employers, public leaders, or the press; accurate and detailed information about our current status is essential. As reading researchers John Carroll and Jean Chall observed in their book *Toward a Literate Society*, "any national program for improving literacy skills would have to be based on the best possible information as to where the deficits are and how serious they are."[4] Surprisingly, though, we have lacked accurate and detailed information about literacy in our nation — including how many individuals have limited skills, who they are, and the severity of their problems.

In 1988, Congress asked the U.S. Department of Education to address this need for information on the nature and extent of adult literacy. In response, the Department's National Center for Education Statistics and Division of Adult Education and Literacy called for a national household survey of the literacy skills of adults in the United States. A contract was awarded to Educational Testing Service and a subcontract to Westat, Inc. to design and conduct the National Adult Literacy Survey, results from which are presented in these pages.

[4] J.B. Carroll and J.S. Chall, eds. (1975). *Toward a Literate Society: A Report from the National Academy of Education.* New York, NY: McGraw Hill. p. 11.

During the first eight months of 1992, trained staff conducted household interviews with nearly 13,600 individuals aged 16 and older who had been randomly selected to represent the adult population in this country. In addition, some 1,100 inmates from 80 federal and state prisons were interviewed to gather information on the skills of the prison population. Finally, approximately 1,000 adults were surveyed in each of 12 states that chose to participate in a special study designed to produce state-level results that are comparable to the national data. Each individual was asked to spend about an hour responding to a series of diverse literacy tasks and providing information on his or her background, education, labor market experiences, and reading practices.

The results of the National Adult Literacy Survey comprise an enormous set of data that includes more than a million responses to the literacy tasks and background questions. More important than the size of the database, however, is the fact that it provides information that was previously unavailable — information that is essential to understanding this nation's literacy resources.

To ensure that the survey results will reach a wide audience, the committees that guided the project recommended that the findings be issued in a series of reports. This volume discusses the results for the older adult population. The series also includes a report that provides an overview of the results of the survey as well as additional reports that offer a more detailed look at particular issues, including:

- literacy in the work force
- literacy and education
- literacy among prison inmates
- literacy and cultural diversity
- literacy practices

A final report conveys technical information about the survey design and the methods used to implement it.

Although these reports focus almost exclusively on the results of the National Adult Literacy Survey, their contents have much broader implications. The rich collection of information they contain can be used to inform policy debates, set program objectives, and reflect on our society's literacy resources and needs.

Irwin S. Kirsch
Project Director

EXECUTIVE SUMMARY

For age is opportunity no less than youth itself.

—*Henry Wadsworth Longfellow*

As life expectancies continue to rise and as current demographic patterns continue to play themselves out, older people are becoming an increasingly large and important segment of the United States population. Consider these statistics. At the beginning of the twentieth century, fewer than 1 in 25 Americans was age 65 or older. Today, more than 1 in 8 are in this age group. In 1990 there were approximately 31 million adults in the United States age 65 and older. Between 2010 and 2030, as the "Baby Boom" ages, the number of older adults in the United States is projected to more than double. In fact, individuals age 65 and older may outnumber those under 18. Further, the "oldest old" population, comprising adults age 85 and older, is expected to grow faster than any other segment of the older adult population in the coming decades.[1]

These demographic patterns have profound implications. Perhaps one of the greatest challenges our society faces is the need to find new and better ways to enhance the opportunities of older adults to live full, independent, and productive lives through their later years. While changing medical technologies make it possible for people to live longer, these do not ensure health or happiness. In fact, growing numbers of older adults suffer from chronic health problems and are either physically or mentally impaired. As one report recently put it, "Where length of life has been an important societal issue in the past, quality of life (active life expectancy) is an issue of increasing importance."[2]

Thus, beyond providing the necessary health and social support services for older persons, it is also important to address their literacy needs. Literacy helps individuals-old or young—to continue to learn new things, to read for pleasure, to be informed about the world and their communities, to handle everyday tasks, to take care of their own needs. Literacy also is essential in

[1] U.S. Department of Health and Human Services. (1991). *Aging America.* Washington, D. C.: Department of Health and Human Services. pp. xix, 74-5. Cynthia M. Taeuber. (1992). *Sixty-five Plus in America.* Washington, D, C.: U.S. Department of Commerce, Bureau of the Census, Current Population Reports. pp. 2.3-2.8.

[2] Cynthia M. Taeuber. (1992). *Sixty-five Plus in America.* Washington, DC.: U.S. Department of Commerce, Bureau of the Census, Current Population Reports. p. vi.

enabling older persons to remain in or rejoin the work force, to contribute to others of all generations through volunteerism, civic participation, and family support. Efforts to respond to the literacy needs of older adults must be grounded in a thorough understanding of the current status. The National Adult Literacy Survey makes it possible, for the first time, to construct a detailed picture of the literacy skills of older adults in the United States. This national study, conducted in 1992, assessed three types of literacy—prose, document, and quantitative.

This report examines the literacy proficiencies of older adults in this country, defined as persons age 60 and over. This age definition is used because the transition to retirement often begins approximately at age 60, and because older adulthood is commonly associated with retirement. Although age 65 is often viewed as the "normal" retirement age, the average retirement age is actually about 62. At age 60, most people are still working; by 65, most are retired.[3] Accordingly, if this report had defined older adults as those age 65 and older, it would have ignored individuals in the important transition years (age 61 to 64).

A brief summary of the key survey findings is offered in the following pages. More detailed information is presented in the subsequent chapters of the report.

Literacy in the Older Adult Population

Adults age 60 and over area heterogeneous group in their characteristics as well as in their literacy skills. Still, the results of the National Adult Literacy Survey indicate that low levels of prose, document, and quantitative literacy are a significant problem for a large portion of the older adult population in the United States.

- Seventy-one percent of adults age 60 and older, or approximately 29 million individuals nationwide, demonstrated limited prose skills, performing in the two lowest levels of prose literacy defined in the survey.
- Slightly more than two-thirds, or 68 percent, of older adults appeared to have difficulty finding and processing quantitative information in printed materials. In population terms, this means that an estimated 28 million persons age 60 and older across the nation have limited quantitative literacy skills.
- The problem appears to be even more acute in the area of document literacy, which is associated with activities such as filling out forms, reading and following directions, and using schedules. Four of every five older adults

[3] W.J. Wiatrowski. (1993) "Factors Affecting Retirement Income." *Monthly Labor Review*. 116(3). pp. 25-35.

demonstrated limited document literacy skills in the assessment, performing in the two lowest proficiency levels defined.

Large differences in literacy skills are found between older and younger adults. On average, individuals age 60 and older displayed more limited skills than those under age 60.

- Notable differences in performance are also evident within the older adult population. Those age 60 to 69 outperformed those age 70 to 79, who in turn outperformed those age 80 and older.

- Many older individuals with limited literacy skills do not seem to believe that they have a problem. The percentage of older Americans who said they perform various types of literacy activities "very well" was about the same as that of persons under 60. In actuality, however, the average literacy proficiencies of older adults were much lower than those of younger persons.

- Many older adults reported receiving help from family or friends with literacy tasks such as filling out forms, writing notes and letters, doing math, and processing written information. Yet, the number of older persons who appear to need such help, as evidenced by their literacy proficiencies, is far larger than the number who said they receive assistance.

Literacy Profiles for Various Subgroups of the Older Adult Population

How do literacy proficiencies vary within the older adult population? What explains the differences in skills observed between older and younger adults? The performance gaps can be partly explained by factors such as education and visual impairment.

- Regardless of the age group, literacy proficiencies tend to increase as level of education increases.

- Older Americans tended to have completed less schooling than younger individuals.

- Older adults were more likely than those under age 60 to have visual impairments that may impede their ability to read and process printed information.

- Older adults were slightly less likely than younger adults to report that they usually speak English only.

Education, language background, and visual impairments do not fully explain the differences in literacy proficiency between the younger and older populations, however. In general, even when these factors are held constant, adults under age 60 still tended to demonstrate stronger literacy proficiencies than those age 60 and over.

[illegible] Employment Status as They [illegible] Literacy [illegible] Older Adult Population

The National Adult Literacy Survey makes it possible to explore relationships between older adults' employment and civic participation and their demonstrated literacy proficiencies. The data can also be used to study the association between income and literacy.

- The literacy skills of older persons who were employed or who were retired and volunteering are higher, on average, than those of their peers who were retired or unemployed.
- Individuals age 60 and older who had recently performed volunteer work and those who had voted in a recent national or state election performed better in the literacy assessment than those who had not.
- Older adults with annual household incomes below $10,000 were disproportionately likely to display limited literacy skills.

Literacy Practices and Proficiencies in the Older Adult Population

The survey results also offer valuable insights into the types of literacy activities that older adults engage in and the relationships between these activities and their literacy proficiencies.

- Adults age 60 and older were more likely than younger adults to report that they did not learn certain literacy skills at all, or that they learned them at home rather than at school. In general, learning skills at school or in the workplace appears to be related to higher literacy proficiencies, while learning skills at home does not.
- Older adults who reported that they regularly use the public library outperformed those who said they do not. This finding is important because the library often serves as a social meeting place in addition to being a reading resource.
- Older adults who rely extensively on newspapers and magazines for information about current events, public affairs, and government outperformed those who depend heavily on television or family members
- Adults age 60 and older were less likely than those under 60 to report that they often read or write letters, fill out forms, and use arithemetic in everyday life.
- Older and younger workers performed various types of work-related literacy tasks with about the same frequency. Yet, older employees who engaged in these tasks tended to display more limited literacy skills than their younger counterparts.

Reflections on the Results

In summary, many older Americans demonstrated limited prose, document, and quantitative literacy skills in the National Adult Literacy Survey. Although there is much rhetoric about greater self-actualization and social participation for older adults, limited literacy skills clearly represent a barrier to attaining these goals.

As the authors examined the survey data and other relevant research, and deliberated on the results, several observations and concerns emerged. Business, government, and social institutions are being confronted with the need to address the literacy needs of older persons. They must consider how they communicate with older adults, many of whom are visually impaired. Forms, instructions, letters, and other materials may need to be redesigned with the literacy skills of an aging population in mind. The authors were concerned that education and job training programs that have, in the past, been targeted to younger persons may need to be refocused to address the needs of older persons.

As often noted in the literature, aging persons as well as society as a whole will benefit if older adults are valued as sources of wisdom and expedience and perceived as vital and productive individuals who continue to learn, grow, and contribute throughout their later lives.[4] The National Adult Literacy Study results indicate that older adults who are equipped with strong literacy skills can contribute a great deal to society. These individuals are more likely to participate in civic activities and less likely to need assistance with everyday literacy tasks than are those with limited skills.

Growing numbers of older Americans are contradicting long-standing stereotypes about what it means to be old. Although it is not common to think of older persons as learners, the reality is that many adults in their seventies, eighties, and nineties are continually acquiring new knowledge and skills and want to keep doing so for as long as their minds and bodies permit. Learning is an essential part of what it means to be human, regardless of age. Furthermore, economic realities continue to require many older persons to remain active in the labor force, where strong literacy skills are increasingly required.

The survey findings demonstrate that literacy problems do not only affect young persons. The challenges of having limited literacy skills are experienced by the young and old alike, and so must opportunities to improve and expand one's literacy be available to individuals of all ages.

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[4] R.N. Butler, M.R. Oberlink, and M. Schechter, editors. (1990). *The Promise of Productive Aging: From Biology to Social Policy*. New York: Springer Publishing Company.

INTRODUCTION

Regardless of their age, individuals in this society undertake countless literacy tasks each day: completing forms, reading notes, balancing checkbooks, following written instructions, comparing prices, browsing through news articles. The ability to perform these tasks allows each of us to negotiate wide-ranging aspects of everyday life and to continue learning, growing, and participating in society.

The results of the National Adult Literacy Survey make it possible, for the first time, to take an in-depth look at the literacy proficiencies of America's older adults and to explore the relationships between literacy and an array of individual characteristics and experiences.

This large-scale survey, conducted in 1992, grew out of the Adult Education Amendments of 1988, in which the U.S. Congress called upon the Department of Education to report on the definition of literacy and on the nature and extent of literacy among adults in the nation. In response, the Department's National Center for Education Statistics and the Division of Adult Education and Literacy planned a national household survey of adult literacy In September 1989, the National Center for Education Statistics awarded a four-year contract to Educational Testing Service to design and administer the survey and to analyze and report the results. A subcontract was given to Westat, Inc., for sampling and field operations.

The plan for developing and conducting the National Adult Literacy Survey was guided by a panel of experts from business and industry, labor, government, research, and adult education. This Literacy Definition Committee worked with Educational Testing Service staff to prepare a definition of literacy that would guide the development of the assessment objectives as well as the construction and selection of assessment tasks. A second panel, the Technical Review Committee, was formed to help ensure the soundness of the assessment design, the quality of the data collected, the integrity of the analyses conducted, and the appropriateness of the interpretations of the final results.

This introduction summarizes the discussions that led to the adoption of a definition of literacy for the National Adult Literacy Survey, the framework used

in designing the survey instruments, the populations assessed, the survey administration, and the methods for reporting the results.

Defining and Measuring Literacy

The National Adult Literacy Survey is the third and largest assessment of adult literacy funded by the federal government and conducted by Educational Testing Service. The two previous efforts included a 1985 household survey of the literacy skills of 21- to 25-year-olds, funded by the U.S. Department of Education, and a 1989-90 survey of the literacy proficiencies of job seekers, funded by the U.S. Department of Labor.[1] The definition of literacy that guided the National Adult Literacy Survey was rooted in these preceding studies.

Building on earlier work in large-scale literacy assessment, the 1985 young adult survey attempted to extend the concept of literacy, to take into account some of the criticisms of previous surveys, and to benefit from advances in educational assessment methodology. The national panel of experts that was assembled to construct a definition of literacy for this survey rejected the types of arbitrary standards — such as signing one's name, completing five years of school, or scoring at a particular grade level on a school-based measure of reading achievement — that have long been used to make judgments about adults' literacy skills. Through a consensus process, this panel drafted the following definition of literacy, which helped set the framework for the young adult survey:

> ***Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.***

Unlike traditional definitions of literacy, which focused on decoding and comprehension, this definition encompasses a broad range of skills that adults use in accomplishing the many different types of literacy tasks associated with work, home, and community contexts. This perspective is shaping not only adult literacy assessment but policy as well — as seen in the National Literacy Act of 1991, which defined literacy as "an individual's ability to read, write, and speak in English and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one's goals, and to develop one's knowledge and potential."

[1] I.S. Kirsch and A. Jungeblut. (1986). *Literacy: Profiles of America's Young Adults.* Princeton, NJ: Educational Testing Service. I.S. Kirsch, A. Jungeblut, and A. Campbell. (1992). *Beyond the School Doors: The Literacy Needs of Job Seekers Served by the U.S. Department of Labor.* Princeton, NJ: Educational Testing Service.

The definition of literacy from the young adult survey was adopted by the panel that guided the development of the 1989-90 survey of job seekers, and it also provided the starting point for the discussions of the NALS Literacy Definition Committee. This committee agreed that expressing the literacy proficiencies of adults in school-based terms or grade-level scores is inappropriate. In addition, while the committee recognized the importance of teamwork skills, interpersonal skills, and communication skills for functioning in various contexts, such as the work place, it decided that these areas would not be addressed in this survey

Further, the committee endorsed the notion that literacy is neither a single skill suited to all types of texts, nor an infinite number of skills, each associated with a given type of text or material. Rather, as suggested by the results of the young adult and job-seeker surveys, an ordered set of skills appears to be called into play to accomplish diverse types of tasks. Given this perspective, the NALS committee agreed to adopt not only the definition of literacy that was used in the previous surveys but also the three scales developed as part of those efforts:

Prose literacy — the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and fiction; for example, finding a piece of information in a newspaper article, interpreting instructions from a warranty, inferring a theme from a poem, or contrasting views expressed in an editorial.

Document literacy — the knowledge and skills required to locate and use information contained in materials that include job applications, payroll forms, transportation schedules, maps, tables, and graphs; for example, locating a particular intersection on a street map, using a schedule to choose the appropriate bus, or entering information on an application form.

Quantitative literacy — the knowledge and skills required to apply arithmetic operations, either alone or sequentially, using numbers embedded in printed materials; for example, balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest from a loan advertisement.

The literacy scales provide a useful way to organize a broad array of tasks and to report the assessment results. They represent a substantial improvement over traditional approaches to literacy assessment, which have tended to report on performance in terms of single tasks or to combine the results from diverse tasks into a single, conglomerate score. Such a score fosters the simplistic notion that "literates" and "illiterates" can be neatly distinguished from one another based on a single cutpoint on a single scale. The literacy scales, on the other

hand, make it possible to profile the various types and levels of literacy among different subgroups in our society. In so doing, they help us to understand the diverse information-processing skills associated with the broad range of printed and written materials that adults read and their many purposes for reading them.

In adopting the three scales for use in this survey, the committee's aim was not to establish a single national standard for literacy. Rather, it was to provide an interpretive scheme that would enable levels of prose, document, and quantitative performance to be identified and allow descriptions of the knowledge and skills associated with each level to be developed.

The prose, document, and quantitative scales were built initially to report on the results of the young adult survey and were augmented in the survey of job seekers. The National Adult Literacy Survey's Literacy Definition Committee recommended that a new set of literacy tasks be developed to enhance the scales. These tasks would take into account the following, without losing the ability to compare the National Adult Literacy Survey results to the earlier surveys:

- continued use of open-ended simulation tasks
- continued emphasis on tasks that measure a broad range of information-processing skills and cover a wide variety of contexts
- increased emphasis on simulation tasks that require brief written and/or oral responses
- increased emphasis on tasks that ask respondents to describe how they would set up and solve a problem
- the use of a simple, four-function calculator to solve selected quantitative problems

Approximately 110 new assessment tasks were field tested, and 80 of these were selected for inclusion in the survey, in addition to 85 tasks that were administered in both the young adult and job-seeker assessments. By administering a common set of tasks in each of the three literacy surveys, it is possible to compare results across time and across population groups.

A large number of tasks had to be administered in the National Adult Literacy Survey to ensure that the survey would provide the broadest possible coverage of the literacy domains specified. Yet, no individual could be expected to respond to the entire set of 165 literacy tasks. Accordingly, the survey was designed to give each person participating in the study a subset of the total pool of tasks, while at the same time ensuring that each of the 165 tasks was administered to a nationally representative sample of adults. Literacy tasks were assigned to sections that could be completed in about 15 minutes, and these sections were then compiled into booklets, each of which could be completed in

about 45 minutes. During a personal interview, each survey respondent was asked to complete one booklet.

In addition to the time allocated for the literacy tasks, approximately 20 minutes were devoted to obtaining background and personal information from respondents. Two versions of the background questionnaire were administered, one in English and one in Spanish. Major areas explored included: *background and demographics* — country of birth, languages spoken or read, access to reading materials, size of household, educational attainment of parents, age, race/ethnicity, and marital status; *education* — highest grade completed in school, current aspirations, participation in adult education classes, and education received outside the country; *labor market experiences* — employment status, recent labor market experiences, and occupation; *income* — personal as well as household; and *activities* — voting behavior, hours spent watching television, frequency and content of newspaper reading, and use of literacy skills for work and leisure. These background data make it possible to gain an understanding of the ways in which personal characteristics are associated with demonstrated performance on each of the three literacy scales.[2]

Conducting the Survey

The National Adult Literacy Survey was conducted during the first eight months of 1992 with a nationally representative sample of some 13,600 adults. More than 400 trained interviewers, some of whom were bilingual in English and Spanish, visited nearly 27,000 households to select and interview adults age 16 and older, each of whom was asked to provide personal and background information and to complete a booklet of literacy tasks. Black and Hispanic households were oversampled to ensure reliable estimates of literacy proficiencies and to permit analyses of the performance of these subpopulations.

To give states an opportunity to explore the skill levels of their populations, each of the 50 states was invited to participate in a concurrent assessment. Twelve states—California, Florida, Illinois, Indiana, Iowa, Louisiana, New Jersey, New York, Ohio, Pennsylvania, Texas, and Washington-elected to participate in the State Adult Literacy Survey. In addition to the National Adult Literacy Survey samples, approximately 1,000 adults age 16 to 64 were surveyed in each of these states.

To permit comparisons of the state and national results, the survey instruments administered to the state and national samples were identical and the

[2] A more detailed description of the NALS design and framework can be found in an interim report: A. Campbell, I.S. Kirsch, and A. Kolstad. (1992, October). *Assessing Literacy: The Framework for the National Adult Literacy Survey*. Washington, DC: National Center for Education Statistics.

data were gathered at the same time (except in Florida; its data collection was conducted 1993.

Finally, more than 1,100 inmates in some 80 federal and state prisons were included in the survey. Their participation helped to provide better estimates of the literacy levels of the total population and make it possible to report on the literacy proficiencies of this important segment of society. To ensure comparability with the national survey, the simulation tasks given to the prison participants were the same as those given to the household survey population. However, to address issues of particular relevance to the prison population, a revised version of the background questionnaire was developed. This instrument drew questions from the 1991 Survey of Inmates of State Correctional Facilities sponsored by the Bureau of Justice Statistics of the U.S. Department of Justice. These included queries about current offenses, criminal history, and prison work assignments, as well as about education and labor force experiences.

Responses from the national household, state, and prison samples were combined to yield the best possible performance estimates. (Because of the delayed administration, the results from the Florida state survey were not included in the national estimates, however.) In all, more than 26,000 adults gave, on average, more than an hour of their time to complete the literacy tasks and background questionnaires. Household survey participants who completed as much of the assessment as their skills allowed were paid $20 for their time. The demographic characteristics of the adults who participated in the National Adult Literacy Survey are presented in table 1.

Further information on sampling, the survey administration, statistical analyses, special studies, and the validity of the literacy scales is provided in the appendices. Additional information will be available in a forthcoming technical report.

Special procedures to accommodate older adult respondents

In the earliest stages of planning, the National Adult Literacy Survey was to assess only those individuals between the ages of 16 and 64. When the U.S. Department of Education decided to include older adults in the survey, several decisions had to be made to define the sample and to ensure that the special needs of older respondents were accommodated.

First, the government affirmed that the survey's purpose was to evaluate the literacy skills of adults living in households or prisons. Accordingly, individuals residing in other types of institutions—such as nursing homes, group homes, or psychiatric facilities—would not be surveyed. This decision affects the results for the older adult population, because many aging individuals live in nursing homes and other non-household facilities. Thus, readers of this report should note that

Table 1
The National Adult Literacy Survey Sample

	n	N/1000	Percentage of National Population
Total	26,091	191,289	100%
Sex			
Male	11,770	92,098	48
Female	14,279	98,901	52
Age			
16 to 24	4,593	34,978	18
25 to 59	17,784	116,876	61
60 to 69	2,267	20,171	11
70 to 79	1,005	13,836	7
80 years and older	442	5,428	3
Race/Ethnicity			
White	17,292	144,968	76
Black	4,963	21,192	11
Asian/Pacific Islander	438	4,116	2
Hispanic	3,126	18,481	10
Other	83	729	0

Notes: The total population includes adults living in households and those in prison. The sample sizes for subpopulations may not add up to the total sample sizes due to missing data. The race/ethnicity categories are mutually exclusive. Some estimates for small subgroups of the population may be slightly different from 1990 Census estimates due to the sampling procedures used. Percentages below .5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

the data reflect the performance of older adults living in households or in prisons, not of the entire older adult population.

Second, in developing the survey instruments, special care was taken to include materials and tasks that were relevant to adults of widely varying ages. After preliminary versions of the assessment instruments were developed and after the field test was conducted, the literacy tasks were closely analyzed for bias or "differential item functioning." The goal is to identify any assessment tasks that are likely to underestimate the proficiencies of a particular subpopulation, whether it be older adults, females, or Black or Hispanic adults. Tasks based on a passage printed in very small type might be flagged as biased against older adults because their vision problems make it difficult for them to

read the print. Any assessment item that appeared to be biased against older adults or against one of the other groups was excluded from the final survey.

Finally, interviewers were trained in special techniques for surveying older individuals. For example, they were trained to record any statements that respondents made concerning disabilities or problems (such as arthritis) that might interfere with their performance in the assessment. As explained later, in Appendix A, these notes were used to determine whether certain respondents who did not complete the assessment were unable to do so for reasons related or unrelated to their literacy skills.

Together these procedures raised the likelihood that the survey would provide unbiased, accurate, and reliable information about the literacy skills of older adults in the United States.

Reporting the Results

The results of the National Adult Literacy Survey are reported using three scales, each ranging from O to 500: a prose scale, a document scale, and a quantitative scale. The scores on each scale represent degrees of proficiency along that particular dimension of literacy. For example, a low score (below 225) on the document scale indicates that a person has very limited skills in processing information from tables, charts, graphs, maps, and the like (even those that are brief and uncomplicated). On the other hand, a high score (above 375) indicates advanced skills in performing a variety of tasks that involve the use of complex documents.

Survey participants received proficiency scores according to their performance on the survey tasks. A relatively small proportion of the respondents answered only a part of the survey, and an imputation procedure was used to make the best possible estimates of their proficiencies. This procedure and related issues are detailed in Appendix A.

Some groups of respondents obtained similar scores on the three literacy scales. This does not mean, however, that the underlying skills involved in prose, document, and quantitative literacy are the same. Each scale provides some unique information, especially when comparisons are made across groups defined by variables such as race/ethnicity, education, and age.

The literacy scales allow us not only to summarize results for various subpopulations but also to determine the relative difficulty of the literacy tasks included in the survey. In other words, just as individuals received scale scores according to their performance in the assessment, the literacy tasks received specific scale values according to their difficulty, as determined by the performance of the adults who participated in the survey Previous research has shown that the difficulty of a literacy task, and therefore its placement on the

literacy scale, is determined by three factors: the *structure of the material* — for example, exposition, narrative, table, graph, map, or advertisement; the *content* of the material and/or the *context* from which it is drawn — for example, home, work, or community; and the *nature of the task* — that is, what the individual is asked to do with the material, or his or her purpose for using it.[3]

The literacy tasks administered in the National Adult Literacy Survey varied widely in terms of materials, content, and task requirements, and thus in terms of difficulty. This range is captured in figure 1, which describes some of the literacy tasks and indicates their scale values.

Even a cursory review of this display reveals that tasks at the lower end of each scale differ from those at the high end. A more careful analysis of the range of tasks along each scale provides clear evidence of an ordered set of information-processing skills and strategies. On the prose scale, for example, tasks with low scale values ask readers to locate or identify information in brief, familiar, or uncomplicated materials, while those at the high end ask them to perform more demanding activities using materials that tend to be lengthy, unfamiliar, or complex. Similarly, on the document and quantitative scales, the tasks at the low end of the scale differ from those at the high end in terms of the structure of the material, the content and context of the material, and the nature of the directive.

In an attempt to capture this progression of information-processing skills and strategies, each scale was divided into five levels: *Level 1* (0 to 225), *Level 2* (226 to 275), *Level 3* (276 to 325), *Level 4* (326 to 375), and *Level 5* (376 to 500). The points and score ranges that separate these levels on each scale reflect shifts in the literacy skills and strategies required to perform increasingly complex tasks. The survey tasks were assigned to the appropriate point on the appropriate scale based on their difficulty as reflected in the performance of the nationally representative sample of adults surveyed. Analyses of the types of materials and demands that characterize each level reveal the progression of literacy demands along each scale (figure 2).

While the literacy levels on each scale can be used to explore the range of literacy demands, these data do not reveal the types of literacy demands that are associated with particular contexts in this pluralistic society. That is, they do not enable us to say what specific level of prose, document, or quantitative skill is required to obtain, hold, or advance in a particular occupation, to manage a household, or to obtain legal or community services, for example.

[3] I.S. Kirsch and P.B. Mosenthal. (1990). "Exploring Document Literacy: variables Underlying the Performance of Young Adults," *Reading Research Quarterly*, 25. pp. 5-30. P.B. Mosenthal and I.S. Kirsch. (1992). "Defining the Constructs of Adult Literacy," paper presented at the National Reading Conference, San Antonio, Texas. Additional information will be presented in the technical report on the National Adult Literacy Survey.

Figure 1

Difficulty Values of Selected Tasks Along the **Prose, Document,** and Quantitative Literacy Scales

	Prose	Document	Quantitative
150	**149** **Identify** country in short article	**69** Sign your name.	**191** Total a bank deposit entry
	210 Locate one piece of information in sports article	**151** Locate **expiration date on driver's license**	
	224 Underline sentence explaining action stated in short article	**180** Locate time of meeting on a form	
		214 Using pie graph, locate type of vehicle having specific sales	
225	**226** **Underline** meaning **of** a term given in government brochure on supplemental security income	**232** Locate intersection on a street map	**238** **Calculate** postage and fees for certified mail
	250 Locate two features of information in sports article	**245** Locate eligibility from table of employee benefits	**246** Determine difference in price between tickets for two shows
		259 Identify and enter background information on application for social security card	**270** Calculate total costs of purchase from an order form
275	**275** **Interpret instructions from an appliance warranty**	**277** Identify information from bar graph depicting source of energy and year	**278** Using calculator, calculate difference between regular and sale price from an advertisement
	280 **Write a** brief letter explaining error made on a credit card bill	**296** **Use sign out** sheet to respond to call about resident	**308** Using calculator, determine the discount from an oil bill if paid within 10 days
	304 Read a news article and identify a sentence that provides interpretation of a situation	**314** **Use** bus schedule to determine appropriate bus for given set of conditions	
	316 Read **lengthy article to identify two** behaviors that meet a stated condition	**323** Enter information given into an automobile maintenance record form	
325	**328** State in writing an argument made in lengthy newspaper article	**342** Identify the correct percentage meeting specified conditions from a table Of such information	**325** Plan travel arrangements for meeting using flight schedule
	347 Explain difference between two types of employee benefits	**348** Use bus schedule to determine appropriate bus for given set of conditions	**331** Determine correct change using information in a menu
	359 Contrast views expressed in two editorials on technologies available to make fuel-efficient cars		**350** Using information stated in news article, calculate amount of money that should go to raising *a* child
	362 Generate unfamiliar theme from short poems		**368** Using eligibility pamphlet, calculate the yearly amount a couple would receive for basic supplemental security income
	374 Compare two metaphors used in poem		
375	**382** Compare approaches stated in narrative on growing up	**379** **Use** fable of information to determine pattern in oil exports across years	**375** Calculate miles per gallon using information given on mileage record chart
	410 Summarize two ways lawyers may challenge prospective jurors	**387** Using table comparing credit cards, identify the two categories used and write two differences between them	Determine individual and total costs on an order form for items in a catalog
	423 Interpret a brief phrase from a lengthy news article	**396** **Use** a table depicting information about parental involvement in school survey to write a paragraph summarizing extent to which parents and teachers agree	**405** **Using** information in news article, calculate difference in times for completing a race
500			Using calculator, determine the total cost of carpet to cover a room

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Figure 2

Description of the Prose, Document, and Quantitative Literacy Levels

	Prose	Document	Quantitative
Level 1 0-225	Most of the tasks in this level require the reader to read relatively short text to locate a single piece of information which is identical to or synonymous with the information given in the question or directive. **If plausible** but incorrect information is present in the text, it tends not to be located near the correct information.	Tasks in this level tend to require the reader either to locate a piece of information based on a literal match or to enter information from personal knowledge onto a document. Little, if any, distracting information is present.	Tasks in this level require readers to perform single, relatively simple arithmetic operations, such as addition. The numbers to be used are provided and the arithmetic operation to be performed is specified.
Level 2 226-275	Some **tasks in this level** require readers to **locate a single piece** of information in the text; however, several distracters or plausible but incorrect pieces of information may be present, or low-level inferences may be required. Other tasks require the reader to integrate two or more pieces of information or to compare and contrast easily identifiable information based on a criterion provided in the question or directive.	Tasks in this level are more varied than those in Level 1. Some require the readers to match a single piece of information; however, several distracters may be present, or the match may require low-level inferences. Tasks in this level may also ask the reader to cycle through information in a document or to integrate information from various parts of a document.	Tasks in this level typically require readers to perform a single operation using numbers that are either stated in the task ***or*** easily located in the material. The operation to be performed may be stated in the question or easily determined from the format of the material (for example, an order form).
Level 3 276-325	**Tasks in this level tend to require readers** to make literal or synonymous matches between the text and information given in the task, or to make matches that require low-level inferences. Other tasks ask readers to integrate information from dense or lengthy text that contains no organizational aids such as headings. Readers may also be asked to generate a response based on information that can be easily identified in the text. Distracting information is present, but is not located near the correct information.	Some tasks in this level require the reader to integrate multiple pieces of information from one or more documents. Others ask readers to cycle through rather complex tables or graphs which contain information that is irrelevant or inappropriate to the task.	In tasks in this level, two or more numbers are typically needed to solve the problem, and these must be found in the material. The operation(s) needed can be determined from the arithmetic relation terms used in the question or directive.
Level 4 326-375	These tasks require readers to perform multiple-feature matches and to integrate or synthesize information from complex or lengthy passages. More complex inferences are needed to perform successfully. Conditional information is frequently present in tasks at this level and must be taken into consideration by the reader.	Tasks in this level, like those at the previous levels, ask readers to perform multiple-feature matches, cycle through documents, and integrate information; however, they require a greater degree of inferencing. Many of these tasks require readers to provide numerous responses but do not designate how many responses are needed. Conditional information is also present in the document tasks at this level and must be taken into account by the reader.	These tasks tend to require readers to perform two or more sequential operations or a single operation in which the quantities are found in different types of displays, or the operations must be inferred from semantic information given or drawn from prior knowledge.
Level 5 376-500	Some tasks in this level require the reader **to search for information in** dense text which contains a number of plausible distractors. Others ask readers to make high-level inferences or use specialized background knowledge. Some tasks ask readers to contrast complex information.	Tasks in this level require the reader to search through complex displays that contain multiple distractors, to make high-level text-based inferences, and to use specialized knowledge.	These tasks require readers to perform multiple operations sequentially. They must disembed the features of the problem from text or rely on background knowledge to determine the quantities or operations needed.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Nevertheless, the relationships among performance on the three scales and various social or economic indicators can provide valuable insights, and that is the goal of this report.

About This Report

This report examines the literacy skills of the older adult population, that is, adults age 60 and older. Chapter 1 profiles the literacy skills of the older adult population as a whole and of various subgroups defined by age, sex, education, race/ethnicity, household income, visual impairment, and region. Chapter 2 compares the literacy proficiencies of the 60-and-older population with the under 60- population with respect to the variables of education, reason for leaving school, where literacy skills were acquired, help received with various materials and language learned before starting school. Chapter 3 discusses economic issues among the elderly including labor force participation, household income by sex, race/ethnicity, and education. Chapter 4 deals with such subjects as volunteer activity, library use, use of various media, and self-assessment of literacy abilities.

In interpreting the results of this study, readers should bear in mind that the literacy tasks contained in this assessment and the adults invited to participate in the survey are representative samples drawn from their two respective universes. As such, they are subject to some measurable degree of uncertainty. Scientific procedures employed in the study design and the scaling of literacy tasks, however, permit a high degree of confidence in the resulting estimates of task difficulty. Similarly, the sampling design and weighting procedures applied in this survey assure that participants' responses can be generalized to the populations of interest.

When comparisons between various subpopulations are made, statistical tests are applied to the data in order to establish that differences are significant. These significance tests take into account the magnitude of the differences (for example, the difference in average document proficiency between high school and college graduates), the size of the standard errors associated with the numbers being compared, and the number of comparisons being made. Only statistically significant differences (at the .05 level) are discussed in this report. Readers who are interested in making their own comparisons are therefore advised not to use the numbers alone to compare various groups, but rather to evaluate such comparisons using statistical tests.[4]

[4] To determine whether the difference between two groups is statistically significant, one must estimate the degree of uncertainty (or the standard error) associated with the difference. To do so, one squares each group's standard error and, sums these squared standard errors, and then takes the square root of this sum. The difference between the two groups plus or minus twice the standard error of the difference is the confidence interval. If the confidence interval does not contain zero, then the difference between the two groups is said to be statistically significant.

The goal of this report is to provide useful information to those who wish to understand the current status of literacy among the nation's older adult population and to strengthen existing programs and policies. In considering the results, readers should keep in mind that this was a survey of literacy only in the English language. Thus, the results do not capture the literacy resources and abilities that some respondents possess in languages other than English.

A Note on Interpretations

In reviewing the information contained in this report, readers should be aware that no single factor determines what an individual's literacy proficiencies will be. All of us develop our own unique repertoire of competencies depending on a wide array of conditions and circumstances, including our family backgrounds, educational attainments, interests and aspirations, economic resources, and employment experiences. This survey focuses on some, but not all, of these variables.

Furthermore, although the survey results reveal that certain characteristics are related to literacy, it is impossible to determine, from a survey administered at one point in time, the direction of these relationships. In other words, it is impossible to identify the extent to which literacy shapes particular aspects of our lives or is, in turn, shaped by them. For example, there is a strong relationship between educational attainment and literacy proficiencies. On the one hand, it is likely that staying in school longer does strengthen an individual's literacy skills. On the other hand, it is also true that those with more advanced skills tend to remain in school longer. other variables, as well, are likely to play a role in the relationship between literacy and education. In interpreting such relationships in this report, the authors have emphasized that causal assertions are speculative.

A final note deserves emphasis. This report describes the literacy proficiencies of various subpopulations defined by characteristics such as age, sex, race, ethnicity, and educational background. While certain groups demonstrated lower literacy skills than others on average, within every group there were some individuals who performed well and some who performed poorly. Accordingly, when one group is said to have lower average proficiencies than another, this does not imply that all adults in the first group performed worse than those in the second. Such statements are only intended to highlight differences among the average proficiencies of groups and, therefore, do not capture the variability within each group.

CHAPTER 1

Literacy in the Older Adult Population

This chapter profiles the prose, document, and quantitative literacy skills of older adults in the United States—those age 60 and older.[1] In addition to examining differences in performance within the older adult population, we analyze the literacy proficiencies of older adults in comparison with those of younger adults.[2] The latter part of the chapter compares older adults' self-assessed literacy skills with their demonstrated proficiencies. Finally, we examine the extent to which adults in various age groups receive assistance with various types of everyday literacy tasks, another indicator of their proficiencies.

Assessing Literacy

As explained in the Introduction, each individual who participated in the National Adult Literacy Survey was asked to complete a background questionnaire requesting demographic and other information, as well as a booklet of prose, document, and quantitative literacy tasks. Respondents' literacy proficiencies were calculated according to their performance on these tasks. The assessment results are reported using three literacy scales, each ranging from O to 500: a prose scale, a document scale, and a quantitative scale. The scores on each scale represent degrees of proficiency along that particular dimension of literacy. For example, a low score (below 225) on the document scale indicates that a person has very limited skills in processing information from tables, charts, graphs, maps, and the like (even those that are brief and uncomplicated). On the other hand, a high score (above 375) indicates advanced skills in performing a variety of tasks that involve the use of complex documents.

[1] Age 60, rather than age 65, was used as the lower limit because older adulthood is generally associated with retirement, which generally occurs at about age 62. Many adults in their early 60s are in transition to retirement, and defining the older adult population as those age 65 and older would omit this important segment of the population.

[2] Readers seeking more detailed information on the literacy proficiencies of the under-60 population can find these data in the other reports on the National Adult Literacy Survey. See, for example, Irwin S. Kirsch, Ann Jungeblut, Lynn Jenkins, and Andrew Kolstad. (1993). *Adult Literacy in America*. Washington, D.C.: U.S. Department of Education.

Throughout this report, adults' literacy skills are examined in two ways. In one approach, we examine the percentages of adults who performed in each level on the prose, document, and quantitative literacy scales. The five literacy levels defined on each scale are: Level 1 (ranging from O to 225), Level 2 (226 to 275), Level 3 (276 to 325), Level 4 (326 to 375), and Level 5 (376 to 500). Appendix A describes the literacy levels in detail and includes examples of the types of tasks that are likely to be performed successfully by individuals performing in each level of prose, document, and quantitative literacy. The second approach used to report on the performance results focuses on the average proficiencies of various subpopulations on each of the three literacy scales. This information provides a way to make general comparisons among groups.

Because each literacy level encompasses a range on a given scale, the tasks in any particular level are not homogeneous and neither are the individuals who performed in that level. Tasks in the high end of the range for a given level are more challenging than those in the low end. Similarly, individuals whose proficiencies are in the high end of a level demonstrated success on a more challenging set of literacy tasks than those who scored in the low end. The group of adults in Level 1 is especially heterogeneous, as it includes individuals who successfully performed relatively undemanding literacy tasks, those who tried to perform these tasks but did not succeed, and those with such limited skills (or limited English proficiency) that they did not try to respond at all (see Appendix A). Thus, while the literacy levels are discussed as distinct units, the variations in performance within each level should be kept in mind.

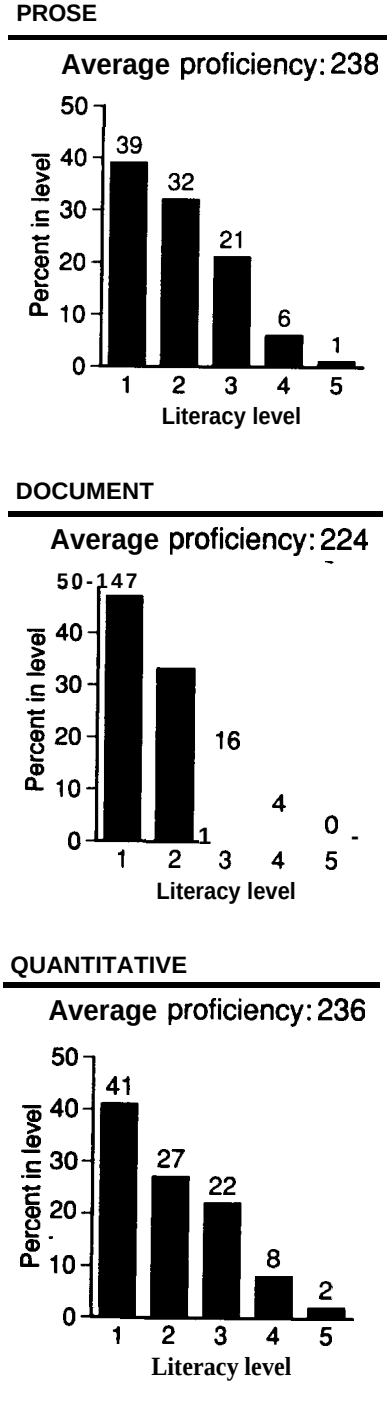
Literacy Proficiencies in the Older Adult Population Overall

Across the literacy scales, 39 to 47 percent of the older adult population scored in Level 1 (figure 1.1, table 1.1). Translated into population terms, this means that 15 to 18 million of the 39 million adults age 60 and older in the United States demonstrated skills in the lowest literacy level defined in this survey. These individuals may be able to read short pieces of text to find single facts (prose literacy), enter personal information on a form (document literacy), or add numbers set up in column format (quantitative literacy). Some adults who performed in the lower end of Level 1, however, may have difficulty performing even these types of tasks.

The percentage of older adults who performed in Level 1 was higher on the document literacy scale (47 percent) than on the prose (39 percent) or quantitative (41 percent) scales. This suggests that many older adults have difficulty performing literacy tasks that involve the use of forms, schedules, tables, and other types of documents that are often encountered in everyday life.

Figure 1.1

Percentages of older adults in each literacy level and average literacy proficiencies



Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Thirty-two percent of the older adult population performed in Level 2 on the prose scale, while 33 percent scored in this level on the document scale and 27 percent scored in this level on the quantitative scale. In population terms. this means that about 11 to 13 million older adults performed in the second lowest literacy level on each literacy scale. Older adults who performed in the second level of prose literacy may be able to make low-level inferences and integrate two or more pieces of information based on what they read. Older adults who scored in this level on the document scale displayed the ability to locate a piece of information in a document in which plausible but irrelevant information was present. Further, they were likely to be able to integrate information from different parts of a document. Adults age 60 and older who performed in Level 2 on the quantitative literacy scale demonstrated skills in adding, subtracting, multiplying, and dividing simple numbers found in printed materials.

When the percentages who performed in the two lowest literacy levels are combined, 71 percent of the older adult population scored in Level 1 or 2 on the prose scale, 80 percent scored in these levels on the document scale, and 68 percent scored in these levels on the quantitative scale.

Slightly more than 20 percent of older adults performed in Level 3 on the prose and quantitative literacy scales. On the document scale, 16 percent performed in this level. In population terms, this means that, on each literacy scale, 6 to 9 million older adults scored in the third literacy level. Adults in

Table 1.1

Percentages of older adults in each literacy level and average literacy proficiencies

Literacy scale	n	WGT N (/1,000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average proficiency
Prose	3,714	39,435	39 (1.3)	32 (1.4)	21 (1.1)	6 (0.8)	1 (0.2)	238 (1.5)
Document	3,714	39,435	47 (1.1)	33 (1.2)	16 (0.9)	4 (0.6)	0† (0.1)	224 (1.5)
Quantitative	3,714	39,435	41 (1.2)	27 (0.9)	22 (1.0)	8 (0.6)	2 (0.3)	236 (2.0)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Level 3 on the prose scale were likely to be able to integrate information from relatively long or dense text, and those performing in this level on the document scale displayed skills in integrating multiple pieces of information in documents. Adults in the third level of quantitative literacy were likely to succeed with arithmetic operations using two or more numbers found in text.

Just 6 percent of older adults performed in Level 4 on the prose scale. They were likely to be able to synthesize information from lengthy or complex passages. Four percent scored in Level 4 on the document scale, indicating that they were successful in making inferences based on forms and other documents. Eight percent performed in the fourth level of quantitative literacy. These individuals were likely to be able to perform sequential arithmetic operations using numbers found in different types of displays. Across the literacy scales, an estimated 1.5 to 3 million older adults demonstrated literacy skills associated with Level 4.

Less than one million older adults performed in the highest level of prose, document, or quantitative literacy. Only 1 to 2 percent scored in Level 5 on the prose and quantitative scales, and less than 1 percent scored in this level on the document scale. To perform in the highest level of prose literacy, respondents must contrast information found in written materials, make high-level inferences, or search for information in dense text. On the quantitative scale, they must determine features of arithmetic problems by examining text or using background knowledge and then perform multiple arithmetic operations. On the document scale, they must search and use complex displays. The results indicate that most older adults are likely to have difficulty performing such tasks with a high degree of consistency.

The average proficiency results repeat the general pattern observed in the literacy levels. The average prose and quantitative scores of adults age 60 and older (238 and 236, respectively) are higher than the average document score (224). Thus, on the prose and quantitative literacy scales, the average proficiencies of older adults lie within the low end of the Level 2 range, while on the document scale, their average score is in the high end of the Level 1 range.

Differences in Literacy Proficiencies Within the Older Adult Population

Within the older adult population, the percentages of older adults who performed in the two lowest literacy levels tend to increase with age (table 1.2). Across the literacy scales, approximately two-thirds to three-quarters of adults age 80 and older performed in Level 1, compared with about one-third to one-half of those under age 80. Again the findings on the document scale are

especially striking. Three-quarters of adults age 80 and older performed in Level 1 on this scale; 96 percent performed in Level 1 or 2. These results indicate that most adults age 80 and older are likely to be able to perform only the least challenging literacy tasks using relatively simple documents. Performance is somewhat better among 60- to 69-year-olds and 70- to 79-year-olds; still, more than 70 percent of adults age 60 to 69 and more than 80 percent of adults age 70 to 79 performed in Level 1 or 2 on the document literacy scale.

Average prose, document, and quantitative proficiencies also tend to decrease as age increases. For example, adults age 60 to 69 have an average prose literacy score of 252, compared with 231 for those age 70 to 79 and just 200 for those age 80 and older. Similar patterns occur on the document and quantitative literacy scales. On all three scales, the average proficiencies of adults age 80 and older are within the Level 1 range, while those of adults under age

Table 1.2

Percentages of older adults in each literacy level and average literacy proficiencies, by age

Literacy scale/ age	n	WGT N (/1,000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average proficiency
Prose								
60 to 69	2,267	20,171	30 (1.7)	33 (1.9)	27 (1.3)	8 (0.9)	1 (0.3)	252 (1.7)
70 to 79	1,005	13,836	42 (2.3)	33 (2.2)	19 (1.9)	5 (1.5)	1 (0.4)	231 (2.9)
80 and older	442	5,428	66 (3.1)	27 (3.5)	6 (1.3)	1 (1.3)	0† (0.2)	200 (3.9)
Document								
60 to 69	2,267	20,171	37 (1.5)	37 (1.4)	21 (1.4)	5 (0.8)	1 (0.2)	239 (1.6)
70 to 79	1,005	13,836	52 (2.1)	32 (2.2)	13 (1.5)	3 (0.9)	0† (0.1)	218 (2.6)
80 and older	442	5,428	75 (2.4)	21 (2.7)	4 (1.6)	0† (0.5)	0† (0.0)	185 (4.0)
Quantitative								
60 to 69	2,267	20,171	31 (1.5)	29 (1.5)	26 (1.5)	11 (1.3)	2 (0.4)	253 (2.0)
70 to 79	1,005	13,836	45 (2.0)	25 (2.2)	21 (1.8)	7 (1.0)	2 (0.6)	228 (3.0)
80 and older	442	5,428	65 (2.9)	24 (2.5)	9 (2.0)	2 (1.0)	1 (0.5)	192 (5.4)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

80 tend to be within the Level 2 range. An exception: the average document score of adults age 70 to 79 is also in the Level 1 range.

Comparing the Literacy Proficiencies of Older and Younger Adults

Major differences in performance exist between older and younger persons. Adults age 60 and older demonstrated significantly lower average prose, document, and quantitative proficiencies than adults age 16 to 59. The average prose score for younger adults is 282, which lies within the range for Level 3, while the average prose score for older adults is only 238, which falls in the Level 2 range (table 1.3). Similar patterns are found in the area of quantitative literacy. On this scale, the average score of the under-60 population is 280, while that of the older adult population is 236.

Table 1.3

Percentages of adults in each literacy level and average literacy proficiencies, by age

Literacy scale/ age	n	WGT N (/1,000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average proficiency
Prose								
60 and older	3,714	39,435	39 (1.3)	32 (1.4)	21 (1.1)	6 (0.8)	1 (0.2)	238 (1.5)
16 to 59	22,377	151,854	16 (0.3)	25 (0.6)	35 (0.8)	20 (0.5)	4 (0.2)	282 (0.6)
Document								
60 and older	3,714	39,435	47 (1.1)	33 (1.2)	16 (0.9)	4 (0.6)	0† (0.1)	224 (1.5)
16 to 59	22,377	151,854	17 (0.4)	27 (0.5)	34 (0.6)	18 (0.5)	3 (0.2)	278 (0.6)
Quantitative								
60 and older	3,714	39,435	41 (1.2)	27 (0.9)	22 (1.0)	8 (0.6)	2 (0.3)	236 (2.0)
16 to 59	22,377	151,854	17 (0.4)	25 (0.6)	34 (0.7)	20 (0.4)	4 (0.2)	280 (0.6)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

The differences in document literacy skills between the two age groups are even more dramatic. Adults under 60 had an average document score of 278, while older adults' average score was 224. Stated differently, older adults performed in the high end of the Level 1 range, on average, while adults under 60 scored in the low end of the Level 3 range.

As signaled by the average performance results, adults age 60 and older were more likely than younger adults to perform in the lower levels on each literacy scale and less likely to attain the higher levels.

On each of the three literacy scales, the percentage of older adults who performed in Level 1 is more than twice the percentage of adults under 60 who did so. Thirty-nine percent of the older adults scored in the lowest level of prose literacy, compared with 16 percent of the under-60 population. On the document and quantitative scales, 47 and 41 percent, respectively, of adults age 60 and older scored in Level 1, compared with 17 percent of younger adults.

On the prose and document scales, older adults were also more likely than those under 60 to score in Level 2. On the quantitative scale, however, the percentages of older and younger adults who scored in this level are about the same.

Combining the percentages of individuals who scored in Level 1 and 2, more than two out of three persons age 60 and older scored in the two lowest levels of prose (71 percent) and quantitative literacy (68 percent). Four out of five (80 percent) scored in the two lowest levels of document literacy. In contrast, on each of the literacy scales, roughly four out of ten adults under 60 (41 to 44 percent) scored in Level 1 or 2.

Across the literacy scales, younger adults (34 to 35 percent) were more likely than older adults (about 16 to 20 percent) to perform in Level 3. Thus, the distribution of performance across Levels 1, 2, and 3 is opposite for the younger and older adult populations. For adults age 60 and older, the percentage of respondents decreases in each successive level, while for adults under age 60, it rises.

On each of the literacy scales, younger adults were more likely than older individuals to perform in Levels 4 and 5. For example, on the prose scale, 20 percent of the under-60 population performed in Level 4, while 4 percent in Level 5. In contrast, only 6 percent and 1 percent of older adults, respectively, attained these levels.

Comparing Demonstrated and Self-reported Literacy Proficiencies

Many older adults demonstrated limited literacy skills in the assessment, but do they perceive their skills as being limited? To answer this question, we analyzed responses to a survey question that asked individuals to indicate how well they understand, speak, read, and write English, and how well they do arithmetic problems when they have to get the numbers from written materials.

Younger adults were more likely than older adults to report that they do these various literacy activities very well (table 1.4 and tables B1.1 and B1.2 in Appendix B). In both age groups, respondents were most likely to describe

Table 1.4

Percentages of adults, by self-reported literacy proficiencies in English and by age

Area of literacy/ age	n	WGT N (/1000)	Row percentages: Very well	Well	Not well/ not at all
Understand					
60 and older	3,709	39,417	78 (1.0)	19 (0.9)	3 (0.3)
16 to 59	22,367	151,788	82 (0.5)	14 (0.5)	3 (0.2)
Speak					
60 and older	3,708	39,385	68 (1.1)	28 (1.1)	4 (0.5)
16 to 59	22,360	151,696	73 (0.9)	23 (0.8)	4 (0.2)
Read					
60 and older	3,701	39,319	66 (1.1)	25 (1.0)	8 (0.7)
16 to 59	22,340	151,608	72 (0.7)	22 (0.6)	7 (0.3)
Write					
60 and older	3,692	39,219	60 (1.4)	28 (1.2)	12 (1.0)
16 to 59	22,307	151,429	65 (0.8)	26 (0.7)	9 (0.3)
Do arithmetic					
60 and older	3,706	39,350	50 (1.2)	33 (1.0)	17 (0.9)
16 to 59	22,355	151,673	54 (0.9)	35 (0.8)	11 (0.3)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due "to" missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

themselves as understanding English very well (78 percent of older adults and 82 percent of younger adults) and least likely to describe themselves as doing arithmetic very well (50 percent of older adults and 54 percent of younger adults). About the same percentages of younger and older adults reported that they do not understand, speak, or read well, but older adults were more likely than younger individuals to describe themselves as not writing or doing arithmetic well.

Self-reported information appears to be a good relative indicator of literacy skills, since there is a relationship between respondents' demonstrated proficiencies in the assessment and their own evaluations of their skills (table 1.5). Self assessments appear to be somewhat optimistic, however. Individuals tended to rate their literacy skills somewhat higher than would appear to be justified on the basis of their performance in the literacy survey.

On all three literacy scales, older persons who said they perform various literacy activities very well displayed higher average proficiencies than those who said they perform these tasks well. The latter group, in turn, outperformed those who reported that they do not do them well. For example, the average prose score of older adults who reported reading very well is 255, compared with 225 for those who reported reading well and 137 for those who reported not reading well (or at all).

Although these variations in performance by self assessment are significant and consistent, the self assessments by themselves do not seem to be fully accurate when considered in light of demonstrated skills, particularly for those who claim to do various types of literacy tasks very well or well. Older adults who reported that they read, write, and do arithmetic very well performed, on average, in the Level 2 range on each literacy scale, while those who said they do them well performed, on average, in the Level 1 to Level 2 range. Since adults in the two lowest literacy levels displayed relatively limited proficiencies, these data indicate that self-reported accounts may understate the extent of the literacy problems among older adults.

On the other hand, the self assessments of those who said they do not read, write, or do arithmetic well are consistent with the performance results. On each literacy scale, these individuals scored well below 200, on average-in the Level 1 range.

Results for the younger population parallel those for older persons. Across the literacy scales, adults age 16 to 59 who said they understand, speak, read, and write English, and do arithmetic very well performed, on average, in Level 3. These individuals tended to outperform their peers who reported doing these activities well, who tended to outperform peers who reported not doing these activities well.

While the average literacy proficiencies of younger adults are consistently higher than those of older adults, the age differences in performance are smaller among individuals who reported not doing various literacy activities well. For example, the average prose score of older adults who read very well (255) is 44 points below that of their younger counterparts (299), whereas the average prose score of older adults who reported not reading well or at all (137) is only 17 points below that of their younger counterparts (154).

Table 1.5

Average prose literacy proficiencies of adults, by self-reported literacy proficiencies in English and by age

Area of literacy/ age	n	WGT N (/1000)	Average proficiencies: Very well	Well	Not well/ not at all
Understand					
60 and older	3,709	39,417	249 (1.7)	211 (3.1)	117 (7.4)!
16 to 59	22,367	151,788	294 (0.6)	247 (1.8)	132 (2.4)
Speak					
60 and older	3,708	39,385	250 (1.8)	222 (3.1)	131 (8.2)!
16 to 59	22,360	151,696	296 (0.7)	261 (1.3)	142 (2.6)
Read					
60 and older	3,701	39,319	255 (1.7)	225 (2.8)	137 (4.6)
16 to 59	22,340	151,608	299 (0.6)	261 (1.2)	154 (2.7)
Write					
60 and older	3,692	39,219	257 (2.1)	231 (2.7)	160 (3.7)
16 to 59	22,307	151,429	300 (0.6)	270 (1.3)	179 (2.4)
Do arithmetic					
60 and older	3,706	39,350	257 (2.1)	236 (2.5)	181 (4.1)
16 to 59	22,355	151,673	302 (0.8)	274 (0.9)	206 (2.4)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

To provide another **measure** of older adults' literacy skills, the survey asked respondents how much help they receive from family members and friends with literacy activities, including filling out forms; reading newspaper articles or other written information; printed information associated with government agencies, public companies, etc.; writing notes and letters; and using basic arithmetic, such as in filling out order forms or balancing a checkbook. The response options were: a lot, some, a little, or none.

Regardless of the type of material, adults age 80 and older were about twice as likely as adults age 60 to 69 and individuals age 70 to 79 to say that they receive a lot of help (table 1.6). For example, 14 percent of adults age 80 and older said they receive a lot of assistance with newspapers, compared with 5 percent of 60- to 69-year-olds and 7 percent of 70- to 79-year-olds. About the same percentages of 70- to 79-year-olds as 60- to 69-year-olds reported receiving a lot of help with the various types of literacy activities.

Sixty- to 69-year-olds were more likely to receive a lot of help with forms (15 percent) and printed information (9 percent) than with other types of materials, while 70- to 79-year-olds were more likely to get a lot of help with forms (17 percent) and printed information (13 percent) than with other materials. Adults age 80 and older were more likely to receive help with forms (32 percent) than with other materials, except printed information (25 percent).

Compared with 25- to 59-year-olds, adults age 60 to 69 were more likely to report receiving a lot of assistance with forms and letters; those age 70 to 79 were more likely to report receiving a lot of assistance with forms, printed information, and arithmetic; and those age 80 and older were more likely to report receiving a lot of assistance with all the activities listed. When one compares the percentages of older and younger individuals who reported getting no help with each of the different types of literacy activities and materials, however, the figures for adults age 60 to 69 and 70 to 79 tend to be about the same as for adults age 25 to 59.

Within each age group there are differences in average literacy proficiencies by the amount of help received with filling out forms (table 1.7). For adults age 60 to 69, those who get a lot of help have lower average document scores (202) than those who get some, a little, or no help (237, 239, and 251, respectively). In addition, adults who receive some help have lower average proficiencies than those who receive none. For adults age 70 to 79, the average document score of those who reported getting a lot of help (182) is considerably lower than those of individuals who reported getting a little or no help (219 and 232, respectively). For adults age 80 and older, individuals who receive a lot of assistance with forms have lower document scores, on average, than those who did not receive any help.

Table 1.6

Percentages of adults, by amount of help received with different literacy activities and by age

Activity/ age	n	WGT N (/1,000)	Row percentages: A lot	Some	A little	None
Filling out forms						
16 to 24	4,571	34,873	16 (0.9)	27 (1.0)	26 (1.1)	32 (1.1)
25 to 59	17,768	116,817	9 (0.3)	16 (0.4)	21 (0.5)	54 (0.6)
60 to 69	2,265	20,164	15 (0.9)	16 (1.0)	17 (0.9)	52 (1.6)
70 to 79	1,001	13,789	17 (1.2)	16 (1.4)	18 (1.3)	49 (1.6)
80 and older	440	5,413	32 (2.9)	12 (2.1)	18 (2.1)	37 (2.7)
Reading newspapers						
16 to 24	4,569	34,867	6 (0.5)	15 (0.9)	24 (0.8)	54 (1.1)
25 to 59	17,764	116,758	5 (0.2)	9 (0.3)	16 (0.4)	70 (0.5)
60 to 69	2,266	20,167	5 (0.6)	10 (0.9)	16 (1.0)	69 (1.4)
70 to 79	1,002	13,807	7 (0.9)	11 (1.3)	14 (1.0)	68 (1.5)
80 and older	440	5,413	14 (2.1)	11 (1.9)	12 (1.5)	62 (2.9)
Reading printed information						
16 to 24	4,561	34,780	11 (0.7)	22 (1.0)	28 (0.8)	39 (1.1)
25 to 59	17,745	116,681	7 (0.3)	14 (0.4)	23 (0.4)	56 (0.5)
60 to 69	2,262	20,155	9 (0.8)	15 (1.0)	21 (1.2)	55 (1.5)
70 to 79	1,000	13,785	13 (1.2)	13 (1.3)	19 (1.7)	55 (2.0)
80 and older	440	5,413	25 (2.3)	15 (2.3)	16 (2.1)	45 (3.0)
Writing letters						
16 to 24	4,560	34,821	4 (0.4)	8 (0.6)	14 (0.7)	73 (0.9)
25 to 59	17,744	116,683	4 (0.2)	7 (0.2)	11 (0.4)	77 (0.4)
60 to 69	2,262	20,132	6 (0.5)	6 (0.7)	9 (0.8)	79 (1.2)
70 to 79	999	13,756	7 (0.8)	7 (1.1)	7 (1.0)	79 (1.7)
80 and older	438	5,384	18 (2.1)	8 (1.9)	4 (0.9)	70 (2.8)
Using arithmetic						
16 to 24	4,570	34,856	5 (0.4)	9 (0.6)	14 (0.7)	73 (1.0)
25 to 59	17,765	116,796	4 (0.2)	6 (0.2)	8 (0.3)	83 (0.3)
60 to 69	2,266	20,167	5 (0.6)	6 (0.6)	7 (0.7)	82 (1.0)
70 to 79	1,002	13,807	8 (0.8)	7 (1.1)	6 (0.7)	78 (1.5)
80 and older	439	5,388	17 (2.1)	8 (1.3)	7 (1.1)	68 (1.9)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 1.7

Average proficiencies of adults, by the amount of help received with different literacy activities and by age

Activity/age	n	WGT N (/1,000)	Average proficiencies: A lot	Some	A little	None
Filling out forms				Document		
16 to 24	4,571	34,873	257 (2.9)	275 (2.1)	288 (2.0)	283 (1.9)
25 to 59	17,768	116,817	219 (3.0)	261 (2.1)	283 (1.6)	290 (0.9)
60 to 69	2,265	20,164	202 (4.9)	237 (2.9)	239 (4.0)	251 (2.1)
70 to 79	1,001	13,789	182 (7.3)	210 (6.6)	219 (5.6)	232 (3.0)
80 and older	440	5,413	155 (6.5)	194 (9.3)!	185 (6.0)!	209 (4.7)
Reading newspapers				Prose		
16 to 24	4,569	34,867	226 (5.2)	257 (2.6)	283 (2.0)	287 (1.3)
25 to 59	17,764	116,758	176 (4.9)	246 (2.2)	280 (1.6)	295 (0.8)
60 to 69	2,266	20,167	174 (9.7)!	232 (7.1)!	250 (4.9)	262 (1.9)
70 to 79	1,002	13,807	158 (8.7)!	212 (6.6)	241 (6.6)	239 (3.3)
80 and older	440	5,413	167 (12.4)!	187 (1 1.7)!	203 (10.0)!	209 (4.2)
Reading printed information				Prose		
16 to 24	4,561	34,780	250 (3.8)	277 (2.7)	287 (1.5)	279 (1.8)
25 to 59	17,745	116,681	209 (3.1)	268 (1.9)	291 (1.6)	292 (1.0)
60 to 69	2,262	20,155	192 (6.8)!	247 (3.6)	260 (3.7)	261 (2.2)
70 to 79	1,000	13,785	172 (7.1)!	216 (6.9)	249 (5.0)	242 (4.3)
80 and older	440	5,413	173 (8.1)!	195 (12.6)!	214 (5.8)!	211 (4.6)
Reading printed information				Document		
16 to 24	4,561	34,780	251 (3.8)	277 (2.3)	289 (1.6)	279 (1.7)
25 to 59	17,745	116,681	207 (3.0)	264 (2.0)	287 (1.3)	286 (0.9)
60 to 69	2,262	20,155	182 (5.2)!	236 (3.8)	248 (3.4)	247 (2.3)
70 to 79	1,000	13,785	164 (7.4)!	208 (4.8)	237 (4.6)	227 (3.6)
80 and older	440	5,413	149 (7.3)!	188 (10.2)!	206 (6.9)!	197 (4.7)
Writing letters				Prose		
16 to 24	4,560	34,821	211 (7.1)	254 (4.0)	270 (2.8)	286 (1.2)
25 to 59	17,744	116,683	180 (4.3)	247 (2.4)	277 (1.9)	293 (0.8)
60 to 69	2,262	20,132	180 (9.0)!	230 (7.1)!	250 (5.9)!	260 (1.6)
70 to 79	999	13,756	163 (1 0.6)!	214 (9.0)!	231 (1 1.0)!	239 (3.5)
80 and older	438	5,384	173 (10.9)!	---	---	209 (3.6)
Using arithmetic				Quantitative		
16 to 24	4,570	34,856	216 (6.3)	239 (3.8)	266 (2.9)	284 (1.1)
25 to 59	17,765	116,796	190 (4.7)	231 (2.9)	259 (2.1)	292 (0.7)
60 to 69	2,266	20,167	162 (9.3)!	216 (7.6)!	229 (7.2)!	263 (2.2)
70 to 79	1,002	13,807	151 (10.4)!	181 (13.7)!	214 (9.4)!	242 (3.2)
80 and older	439	5,388	130 (11 .4)!	---	---	210 (4.5)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

--- Sample size is too small to provide a reliable proficiency estimate.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Because much of the data for the other activities and materials should be interpreted with caution, not many comparative statements about proficiencies can be made with certainty. There is, however, a consistent pattern in these results: the proficiencies of adults who receive less help with various types of literacy tasks tend to be higher than those of adults who receive more help. For example, on both the prose and document literacy scales, 60- to 69-year-olds and 70- to 79-year-olds who reported getting little or no help with printed information earned higher average literacy scores than those who reported getting some help.

Some intriguing patterns emerge when older and younger individuals are compared. Adults age 60 to 69 who reported receiving a lot of help with forms have an average document score of 202, which is about the same as the average score of 25- to 59-year-olds. Although the data on the other types of activities or materials should be interpreted with caution, adults age 60 to 69 and those age 25 to 59 who reported receiving a lot of help with reading newspapers, printed information, and writing letters also seem to have comparable prose proficiencies, on average. However, the average prose scores of adults age 70 to 79 and adults age 80 and older who reported receiving a lot of help with forms are lower than those of adults age 25 to 59 (182, 155, and 219, respectively). This pattern also appears to hold true for adults who receive help reading printed information and using arithmetic, but again the data for the two older age groups should be interpreted with caution.

The performance results suggest that many older adults are likely to have difficulty performing various types of literacy tasks. The average prose score of adults age 60 and older is 238; their average document and quantitative proficiencies are 224 and 236, respectively. Adults age 60 to 69 tended to outperform adults age 70 to 79 who, in turn, tended to outperform those age 80 and older.

Thirty-nine percent of the older adults assessed performed in Level 1 on the prose scale, while 47 percent performed in this level on the document scale and 41 percent scored in this level on the quantitative scale. At least two-thirds of older adults performed in Level 1 or 2 on the prose and quantitative scales, and four-fifths scored in the two lowest levels of document literacy.

The average prose, document, and quantitative proficiencies of the older adult population are lower than those of the under-60 population. In general, older adults were more likely than younger individuals to score in Levels 1 and 2 on each literacy scale (with the exception of Level 2 on the quantitative scale).

According to self-reported information, older adults appear to believe that their literacy skills are better than what the actual assessment results indicate. Adults age 60 and older who reported that they read, write, or do arithmetic very well performed, on average, only in the Level 2 range on each of the literacy scales. In contrast, the average literacy scores of adults under 60 who reported reading, writing, or doing arithmetic very well were in the Level 3 range. The performance results for adults who reported not doing these activities well bear out their self-reported evaluations. These adults had average proficiencies below 200.

In general, the older the adult, the more assistance he or she receives with various types of literacy-related tasks. Adults age 80 and older were more likely than younger adults to report getting a lot of help with different types of tasks. Sixty- to 69-year-olds and 70- to 79-year-olds were more likely than adults under 60 to say they get a lot of help with forms and printed information. Although much of the data should be interpreted with caution, adults who receive the most help with different literacy tasks appear to demonstrate lower average literacy proficiencies than those who receive no help.

CHAPTER 2

Literacy Profiles for Various Subgroups of the Older Adult Population

While the first chapter examined the literacy skills of older adults and compared these with the skills displayed by younger adults, this chapter explores the performance of those in various subgroups of the older adult population. Relationships between literacy and education among older and younger adults are explored, as are the literacy skills of various subgroups, including those defined by race/ethnicity, language background, visual impairment, sex, and region of the country.

Level of Education

The education system is a primary means of transmitting literacy. Not surprisingly, then, older adults' prose, document, and quantitative literacy proficiencies tend to vary according to their level of education. On average, literacy scores increase as level of education rises. On the prose scale, for example, older adults who did not receive a high school diploma have an average score of 200; those who earned a high school diploma or its equivalent, a General Educational Development (GED) certificate, have an average score of 253; and those who completed some postsecondary education have an average score of 282 (table 2.1).

These differences in performance by level of education are also reflected in the literacy level results. On the prose and quantitative scales, 65 percent of older adults who lacked high school diplomas performed in Level 1. On the document scale, the figure is 73 percent. Older adults who had earned at least a high school diploma or GED were far less likely to score in this level. Twenty-four to 37 percent of older adults with a high school diploma or GED and 13 to 18 percent of those with some postsecondary education performed in the lowest level on each literacy scale.

Very few adults age 60 and older who had ended their education before or upon completing high school performed in Level 4 or 5. On the other hand, 10 to 20 percent of older adults who had completed some postsecondary education performed in Level 4, and 1 to 5 percent scored in Level 5.

Table 2.1

Percentages of older adults in each literacy level and average literacy proficiencies, by level of education

Literacy scale/ highest level of education	n	WGT N (/1,000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average Proficiency
Prose								
O to 12 years	1,482	17,351	65 (1.9)	27 (1.8)	7 (1.4)	1 (0.4)	0† (0.0)	200 (2.5)
High school/GED	967	10,481	24 (2.3)	44 (2.7)	27 (2.5)	4 (1.1)	0† (0.2)	253 (2.4)
Postsecondary	1,256	11,432	13 (1.6)	30 (2.4)	38 (1.7)	16 (2.1)	3 (0.8)	282 (2.6)
Document								
O to 12 years	1,482	17,351	73 (1.8)	23 (1.8)	4 (1.0)	0† (0.3)	0† (0.0)	189 (2.4)
High school/GED	967	10,481	37 (2.0)	44 (2.1)	17 (2.5)	2 (0.7)	0† (0.1)	237 (2.1)
Postsecondary	1,256	11,432	18 (1.5)	38 (2.2)	33 (2.2)	10 (1.7)	1 (0.3)	268 (2.1)
Quantitative								
O to 12 years	1,482	17,351	65 (2.4)	22 (2.2)	10 (1.4)	2 (0.5)	1 (0.3)	192 (3.4)
High school/GED	967	10,481	28 (1.9)	36 (2.2)	28 (2.7)	8 (1.3)	1 (0.4)	253 (2.2)
Postsecondary	1,256	11,432	13 (1.3)	27 (2.3)	35 (2.6)	20 (1.8)	5 (1.1)	287 (2.7)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Comparing levels of education among older and younger adults

As reported in Chapter 1, the literacy proficiencies of older adults tend to be lower than those of younger adults, and even within the older adult population, skills appear to decline with age. Given the strong association between education and literacy, a question that naturally arises is, to what extent can these differences in performance across the age groups be explained by differences in levels of education? Analyzing the educational attainments of older and younger adults helps to illuminate the relationship between literacy and aging.

The gap in median years of schooling between younger and older adults has narrowed somewhat in the past 30 years and is expected to decrease further by the year 2000.[1] The educational attainments of the older adult

[1] U.S. Department of Health and Human Services. (1991). Aging *America*. Washington, DC: Department of Health and Human Services. p. 189.

population will increase significantly in the coming years because younger cohorts tend to have completed more education than their predecessors.

Nonetheless, today's older adults tend to have less education than younger adults. In the National Adult Literacy Survey, 51 percent of individuals between the ages of 25 and 59 reported having completed some postsecondary education, compared with 33 percent of adults age 60 to 69 (table 2.2). Conversely, only 18 percent of those age 25 to 59 had not earned a high school diploma or GED, compared with 38 percent of 60- to 69-year-olds. About the same percentages of adults age 25 to 59 and those age 60 to 79 (roughly 30 percent) reported that a high school diploma or GED was their highest level of education.

Even within the older adult population, educational attainment tends to decline with age. Individuals age 60 to 69 were less likely than those age 70 to 79 and those age 80 and older to report that they lacked a high school diploma or GED. Thirty-eight percent of 60- to 69-year-olds had not earned this credential, compared with 45 percent of 70- to 79-year-olds and 64 percent of adults age 80 and older. Conversely, 60- to 69-year-olds (33 percent) were more likely than those in the older groups (27 and 21 percent, respectively) to report having completed some postsecondary education.

Table 2.2
Percentages of adults with various levels of education, by age

Age	n	WGT N (/1000)	Row percentages: 0 to 12 years	High school/ GED	Post-secondary
16 to 24	3,606	26,715	19 (0.8)	44 (0.4)	37 (0.6)
25 to 59	17,736	116,496	18 (0.3)	31 (0.3)	51 (0.3)
60 to 69	2,260	19,990	38 (1.4)	29 (1.2)	33 (1.0)
70 to 79	1,001	13,791	45 (1.7)	28 (1.4)	27 (1.5)
80 and older	440	5,403	64 (2.2)	15 (2.2)	21 (2.1)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Comparing literacy proficiencies by level of education

Clearly, then, there are major variations in educational experience across the age groups. This does not fully explain the performance differences observed, however. Even when one controls for education, older persons still tend to display more limited literacy skills than younger persons.

Differences in literacy proficiencies by age are most apparent at the higher levels of education (table 2.3). While adults who completed some postsecondary education tended to score in the Level 3 range regardless of their age group, the average literacy proficiencies of 60- to 69-year-olds with this level of education (280 to 298) are lower than those of their 25- to 59-year-old counterparts (309 to 315). The gap between the two groups is largest on the document literacy scale, where the average score of adults age 60 to 69 is 29 points below that of younger adults; on the prose and quantitative scales, the differences are 22 and 17 points, respectively. The average document score of adults age 70 to 79 who had completed some postsecondary education is in the Level 2 range.

The proficiency differences between younger and older adults are somewhat smaller among those whose highest level of education was a high school diploma or GED. Still, the average literacy proficiencies of high school or GED graduates in the 60 to 69 age group are 11 to 24 points lower than those of adults in the 25 to 59 age group. Again the largest gap between the two age groups is found on the document literacy scale.

Among respondents with less than a high school education, the average literacy proficiencies of 60- to 69-year-olds are comparable to those of 25- to 59-year-olds. On all three literacy scales, the average proficiencies of school dropouts in both age groups lie within the Level 1 range.

Similarly, within the older adult population, differences in performance by age remain even when one compares the literacy proficiencies of individuals with the same level of education. On average, the oldest adults (age 80 and older) still displayed more limited literacy skills than 70- to 79-year-olds who, in turn, displayed more limited skills than 60- to 69-year-olds.

For example, among older adults with between zero and 12 years of schooling, the average prose score of individuals age 80 and older is 182, that of 70- to 79-year-olds is 194, and that of 60- to 69-year-olds is 211.

Among older adults whose highest level of education was a high school diploma or GED, the average prose score of individuals age 80 and older (223) is lower than that of 70- to 79-year-olds (246) and that of 60- to 69-year-olds (262). The data for the oldest age group should be interpreted with caution due the small sample size, however.

Table 2.3
Average proficiencies of older adults with various levels of education, by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: 0 to 12 years	High school/ GED	Post-secondary
16 to 24	3,606	26,715			
Prose			233 (3.3)	274 (2.0)	311 (1.9)
Document			234 (3.6)	274 (2.1)	310 (1.7)
Quantitative			227 (3.5)	272 (2.3)	308 (2.0)
25 to 59	17,736	116,496			
Prose			210 (1.8)	273 (1.1)	315 (0.8)
Document			206 (2.0)	269 (1.0)	309 (0.7)
Quantitative			206 (1.8)	274 (1.1)	315 (0.8)
60 to 69	2,260	19,990			
Prose			211 (3.1)	262 (2.5)	293 (2.5)
Document			201 (2.7)	245 (2.6)	280 (2.5)
Quantitative			209 (3.9)	261 (2.9)	298 (3.1)
70 to 79	1,001	13,791			
Prose			194 (3.3)	246 (4.7)	277 (4.8)
Document			184 (3.2)	231 (4.3)	261 (3.2)
Quantitative			183 (3.9)	248 (5.1)	284 (4.2)
80 and older	440	5,403			
Prose			182 (5.5)	223 (4.9)!	237 (4.7)!
Document			168 (5.3)	207 (6.0)!	221 (6.4)!
Quantitative			170 (7.3)	222 (10.4)!	236 (7.1)!

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Thus, the differences in literacy proficiencies that are found between older and younger adults and among various age groups within the older adult population cannot be fully explained by differences in levels of educational attainment.

Analyzing the relationship between literacy and level of education

In examining these data, one question that arises is, how much of the difference in performance is attributable to education and how much of it is attributable to other factors? This question can be answered with partition analyses, which are useful when two populations—in this case, two age groups—differ in average performance and in the distribution of another relevant confounding variable, such as education. Partition analyses make it possible to isolate, or partition, two interpretable components that comprise the proficiency difference between the groups.

The upper portion of table 2.4 presents the average literacy proficiencies of and proficiency differences between adults age 25 to 59 and those in each of the older age groups. For example, the difference in average prose scores between 25- to 59-year-olds and all adults age 60 and older is 44 points, and the differences in average document and quantitative scores between the two groups are 54 points and 46 points, respectively. The lower part of the table indicates the extent to which these proficiency gaps are due to differences in educational attainment and to factors other than education.

Of the 44-point difference in average prose proficiencies between 25- to 59-year-olds and those age 60 and older, 26 points are attributable to the unequal distribution of educational attainments between the two groups. Even if the two groups had exactly the same distribution of educational attainments, however, the average prose scores of individuals age 25 to 59 would be 23 points higher than those of adults age 60 and older. The difference in average prose scores between older and younger adults that is attributable to the two components (education and other factors) less the original difference between the two groups is 5, which is referred to as the "interaction."

It is interesting to note that on the prose and quantitative literacy scales the differences in average proficiencies between 25- to 59-year-olds and adults age 60 and older are attributable about equally to differences in the distribution of educational attainment and other factors. On the document scale, however, the difference is attributable less to education than to other factors.

When the average proficiencies of adults age 60 to 69 are compared with those of adults age 25 to 59, the differences on the prose and quantitative scales are explained more by educational attainment than by other factors. In contrast, education and other factors account about equally for the difference in average document scores between these two age groups.

Table 2.4

Comparing average literacy proficiencies by age: differences due to education and other factors

Variable/ literacy scale	Age group				
	25 to 59	60 and older	60 to 69	70 to 79	80 and older
	Average proficiency				
Literacy Scale					
Prose	282.9	238.9	253.5	233.3	199.5
Document	278.0	224.5	239.9	218.0	184.0
Quantitative	282.5	236.0	253.3	229.3	189.4
	Average proficiency difference				
Difference between age 25 to 59 and each older age group					
Prose	---	-44.0	-29.4	-49.6	-83.4
Document	---	-53.5	-38.1	-60.0	-94.9
Quantitative	---	-46.2	-29.2	-53.2	-93.1
Difference due to unequal distribution of educational attainment					
Prose	---	-25.8	-20.7	-26.8	-42.0
Document	---	-25.0	-20.1	-25.9	-40.5
Quantitative	---	-26.7	-21.4	-27.7	-43.7
Difference due to other factors					
Prose	---	-23.1	-13.2	-27.5	-59.7
Document	---	-33.8	-22.6	-40.0	-72.1
Quantitative	---	-23.0	-12.2	-26.7	-65.0
Interaction					
Prose	---	4.9	4.5	4.7	18.2
Document	---	5.4	4.6	6.0	18.6
Quantitative	---	3.3	4.5	1.2	15.6

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

When the average literacy proficiencies of 70- to 79-year-olds are compared with those of 25- to 59-year-olds, education and other factors account for an equivalent amount of the differences on the prose and quantitative scales. The differences in average document proficiency, on the other hand, are attributable less to education than to other factors. On all three literacy scales, the differences in average scores between 25- to 59-year-olds and those age 80 and older are explained less by education than by other factors.

In summary, differences in educational attainment explain more of the performance gap between the young (age 25 to 59) and the "young old" (60 to 69) than do other factors. For the "oldest old" (those age 80 and older), the opposite is true. In any case, older adults tend to display more limited literacy proficiencies than younger adults with the same level of education.

Together these findings suggest that maturation effects—or changes that occur over the course of a person's lifetime—have a negative impact on literacy skills, on average, and that this impact is not compensated for by education alone. In other words, differences in literacy skills across the older age groups may relate to more generalized differences in performance. Psychological studies of aging have found that the speed with which adults perform certain types of cognitive and sensory tasks, and performance on various memory and learning tasks, do tend to decline with age.[2] These areas are beyond the scope of this survey, however, since this was a cross-sectional study, not a longitudinal one, and because this was an assessment of literacy and not of other skills. It is also important to remember that there is tremendous variation within the human population, so that any skill differences that are found among older adults on average are by no means characteristic of all older persons.

Reasons for leaving school

National Adult Literacy Survey respondents who did not earn a high school diploma were asked to indicate their primary reason for leaving school. As discussed in the previous section, older adults were less likely than younger adults to report that they had completed secondary school. The reasons for this interruption in schooling vary across the age groups (table 2.5).

[2] J.E. Birren and K.W. Schaie, eds. (1977). *Handbook of the Psychology of Aging*. New York; D.B. Bromley. (1974). *The Psychology of Human Aging, 2nd ed.* Harmondsworth; N. Charness, ed. (1985). *Aging and Human Performance*. New York; A.T. Welford. (1958). *Ageing and Human Skill*. Oxford; cited in Richard L. Gregory, ed. (1987). *The Oxford Companion to the Mind*. Oxford.

Table 2.5

Percentages of adults who stopped school for various reasons, by age

Age	n	WGT N (/1000)	Financial problems	Went to work	Pregnancy	Lost interest	Academic problems	Personal problems
			Row percentages					
60 and older	1,237	14,433	24 (2.1)	40 (1.9)	1 (0.2)	9 (1.0)	2 (0.4)	25 (1.7)
16 to 59	3,467	25,528	16 (0.9)	23 (1.2)	12 (0.6)	23 (1.0)	4 (0.5)	22 (1.2)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics. National Adult Literacy Survey, 1992.

Dropouts who were age 60 and older were more likely than younger dropouts to report that they left school because of financial problems (24 percent compared with 16 percent) or because they had to work (40 percent compared with 23 percent). On the other hand, adults under 60 were more likely than older adults to report dropping out of school because of pregnancy (12 percent compared with 1 percent) and lack of interest (23 percent compared with 9 percent).

There are no significant differences in literacy proficiencies between older and younger persons who dropped out of high school for financial reasons (table 2.6). Among those who left school to enter the work force, however, younger adults have higher average literacy scores than do older adults. Similarly, among those who lost interest in school, and those who left school for family or personal problems, adults under 60 outperformed their older counterparts, on average.

There appear to be no differences in performance within the older population by reason for dropping out of school. In the younger population, however, those who left school for financial reasons demonstrated the lowest average literacy proficiencies.

Table 2.6
Average literacy proficiencies of adults who stopped school for various reasons, by age

Age/ literacy scale	WGT N n (/1000)	Average proficiencies: Financial problems	Went to work	Pregnancy	Lost interest	Academic problems	Personal problems
60 and older	1,237 14,433						
Prose		195 (6.0)	206 (4.6)	---	207 (6.5)	---	199 (4.8)
Document		189 (4.7)	194 (4.3)	---	199 (6.4)	---	186 (5.7)
Quantitative		188 (8.4)	202 (4.8)	---	209 (8.6)	---	190 (7.1)
16 to 59	3,467 25,528						
Prose		189 (5.2)	226 (3.0)	240 (3.5)	238 (3.2)	227 (6.7)	224 (3.8)
Document		181 (4.6)	223 (2.7)	240 (3.3)	237 (3.2)	224 (6.5)	222 (4.1)
Quantitative		183 (4.5)	229 (3.1)	226 (3.3)	235 (3.5)	218 (6.4)	220 (4.3)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

--- Sample size is too small to provide a reliable proficiency estimate.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Race/ethnicity

In 1992, according to the National Adult Literacy Survey data, 86 percent of the nation's older adults were White, 9 percent were Black, and 5 percent were Hispanic (table 2.7). In contrast, 77 percent of adults under age 60 were White, 12 percent were Black, and 11 percent were Hispanic. The racial /ethnic groups are defined in Appendix D.

Beginning in the early part of the next century, the older minority population is expected to grow more rapidly than the older White population, resulting in more diversity among adults age 60 and older. These changes will occur because of higher fertility rates among nonwhite groups than among White adults. Still, the percentage of older adults who are White will remain higher than the percentages who are Black or Hispanic.[3]

[3] U.S. Department of Health and Human Services. (1991). *Aging America*. Washington, D. C.: Department of Health and Human Services. p. 14.

Within the older adult population, White adults demonstrated consistently higher average literacy proficiencies than their Black or Hispanic peers (table 2.8). The Hispanic data must be interpreted with caution, however, due to the small sample sizes. On all three literacy scales, the average proficiencies of White older adults are in the Level 2 range, while those of Black older adults are in the Level 1 range. The performance gap between White and Black older adults on the quantitative scale is especially large. Although the small sample sizes prevent making detailed inferences, the low average scores of Hispanic older adults suggest that they may be able to perform only the most basic Level 1 tasks successfully.

This pattern of performance differences among older adults in various racial/ethnic groups is consistent with the pattern of results for the under-60 population, where White adults also outperformed Black and Hispanic adults.

Table 2.7
Percentages of adults in various racial/ethnic groups, by age

Age	n	WGT N (/1000)	Row percentages White	Black	Hispanic
60 and older	3,655	38,462	86 (0.8)	9 (0.5)	5 (0.5)
16 to 59	21,726	146,180	77 (0.3)	12 (0.1)	11 (0.3)
60 to 69	2,231	19,643	84 (1.0)	9 (0.6)	7 (0.8)
70 to 79	989	13,491	87 (1.0)	9 (1.0)	4 (0.6)
80 and older	435	5,327	90 (1.3)	7 (1.0)	4 (0.9)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 2.8
Average literacy proficiencies of adults in various racial/ethnic groups, by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies White	Black	Hispanic
60 and older	3,655	38,462			
Prose			248 (1.5)	195 (3.8)	179 (6.4)!
Document			233 (1.5)	182 (2.8)	164 (6.0)!
Quantitative			248 (2.0)	175 (4.7)	163 (7.7)!
16 to 59	21,726	146,180			
Prose			298 (0.8)	245 (1.4)	219 (2.2)
Document			294 (0.8)	239 (1.3)	219 (2.5)
Quantitative			298 (0.8)	234 (1.4)	218 (2.5)
60 to 69	2,231	19,643			
Prose			263 (1.8)	211 (4.3)!	186 (6.8)!
Document			250 (1.7)	197 (4.0)!	176 (7.0)!
Quantitative			265 (2.0)	192 (5.5)!	182 (9.7)!
70 to 79	989	13,491			
Prose			242 (3.0)	182 (7.0)!	164 (12.9)!
Document			227 (2.6)	170 (5.2)!	145 (11.5)!
Quantitative			241 (3.0)	162 (8.8)!	140 (14.6)!
80 and older	435	5,327			
Prose			207 (3.4)	154 (8.1)!	---
Document			192 (3.9)	143 (6.7)!	---
Quantitative			202 (5.4)	131 (10.0)!	---

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

--- Sample size is too small to provide a reliable proficiency estimate.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Racial/ethnic differences in self-reported literacy proficiencies

Significant differences in self-assessed literacy skills are apparent among older adults in various racial/ethnic groups. Among those age 60 and older, White individuals (71 percent) were more likely than Black (51 percent) or Hispanic (29 percent) individuals to say they read very well. Similar patterns are evident in the under-60 population, although the differences between the groups are smaller (table 2.9 and tables B2.1 and B2.2 in Appendix B).

Among those who claim to read very well, the average literacy proficiencies of White older adults fall in the Level 2 range, while those of Black older adults are in the Level 1 range (table 2.10). The average scores of Hispanic older adults also appear to be in the Level 2 range, but the small sample precludes confidence in the data for this group.

White and Black older adults who reported reading very well demonstrate lower average proficiencies than their counterparts in the under-60 population who reported reading well. For example, on the prose scale, the average score of White older adults who said they read very well is 259, compared with 275 for White adults under 60 who said they read well. The average prose score of Black older adults who reported reading very well is 213, compared with 230 for younger Black adults who reported reading well.

Similar trends occur with respect to self-assessed writing abilities (table B2.1 in Appendix B). Almost two-thirds of White adults age 60 and older reported that they write very well (64 percent), compared with 45 percent of Black older adults and 24 percent of Hispanic older adults. Again, the average proficiencies of White older adults are in the Level 2 range, while those of Black older adults are in the Level 1 range. The average scores of Hispanic older adults who said they write well appear to be within the Level 2 range, but again these data should be interpreted with caution.

Table 2.9
Percentages of adults by self-reported reading proficiency in English, by race/ethnicity and by age

Age/ race/ethnicity	n	WGT N (/1000)	Row percentages: Very well	Well	Not well/ not at all
60 and older					
White	2,754	33,001	71 (1.2)	24 (1.2)	5 (0.6)
Black	625	3,347	51 (2.6)	32 (2.8)	18 (1.4)
Hispanic	263	1,997	29 (3.4)	25 (3.3)	46 (3.1)
16 to 59					
White	14,515	111,734	77 (0.8)	21 (0.8)	3 (0.2)
Black	4,322	17,778	67 (1.0)	27 (0.9)	6 (0.5)
Hispanic	2,856	16,447	46 (1.7)	22 (1.1)	32 (1.5)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in Parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

The pattern of performance results with respect to self-assessed arithmetic skills is similar to that for self-assessed reading and writing skills (table B2.2 in Appendix B). More than half the White older adults (55 percent) said they do arithmetic tasks very well, compared with 31 percent of Black and 23 percent of Hispanic older adults. The average scores of these groups vary accordingly, with White older adults performing better, on average, than Black older adults with the same level of self-reported ability.

Table 2.10
Average literacy proficiencies of adults by self-reported reading proficiency in English, by race/ethnicity and by age

Age/ race/ethnicity/ literacy scale	n	WGT N (/1000)	Average proficiencies: Very well	Well	Not well/ not at all
60 and older					
White	2,754	33,001			
Prose			259 (1.7)	231 (3.0)	152 (5.4)!
Document			244 (1.8)	219 (3.4)	158 (7.1)!
Quantitative			259 (2.2)	234 (4.0)	149 (7.3)!
Black	625	3,347			
Prose			213 (4.5)	197 (5.0)!	136 (7.0)!
Document			197 (4.0)	189 (4.3)!	124 (6.3)!
Quantitative			192 (5.5)	185 (6.5)!	106 (9.5)!
Hispanic	263	1,997			
Prose			244 (9.0)!	190 (8.6)!	132 (8.9)!
Document			228 (9.3)!	183 (7.1)!	113 (6.9)!
Quantitative			241 (12.9)!	203 (7.4)!	92 (9.3)!
16 to 59					
White	14,515	111,734			
Prose			308 (0.7)	275 (1.5)	193 (6.5)!
Document			303 (0.7)	273 (1.6)	197 (6.6)!
Quantitative			307 (0.7)	278 (1.8)	199 (6.0)!
Black	4,322	17,778			
Prose			259 (1.5)	230 (2.2)	148 (4.2)!
Document			252 (1.3)	225 (2.6)	151 (4.6)!
Quantitative			247 (1.6)	221 (2.4)	142 (5.7)!
Hispanic	2,856	16,447			
Prose			275 (2.3)	227 (2.8)	135 (2.5)
Document			273 (2.3)	229 (3.1)	135 (2.8)
Quantitative			270 (2.6)	230 (2.8)	135 (2.9)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Race/ethnicity and level of education

Older adults in other racial/ethnic groups (66 percent) were more likely than White older adults (40 percent) to report that they had not completed high school or earned a GED (table 2.11). White adults age 60 and older were more likely than their peers in other racial/ethnic groups to say that they had earned a high school diploma or GED (29 versus 16 percent, respectively) or completed some postsecondary education (31 versus 17 percent, respectively).

Both groups of older adults possess less education than adults under 60, on average. For example, 40 percent of White older adults reported not having earned a high school diploma, compared with 17 percent of the younger White population. Two-thirds of the older adults in other racial/ethnic groups reported having not completed high school, compared with slightly more than one-third of the under-60 population.

Even when one compares those with the same level of education, White adults age 60 and older tended to outperform their peers in other racial/ethnic groups (table 2.12). Regardless of their race/ethnicity, older adults with less

Table 2.11
Percentages of adults with various levels of education, by race/ethnicity and by age

Age/ race/ethnicity	n	WGT N (/1000)	Row percentages: 0 to 12 years	High school/ GED	Post-secondary
60 and older					
White	2,756	33,009	40 (0.9)	29 (0.8)	31 (0.8)
Other	904	6,177	66 (2.2)	16 (1.6)	17 (1.6)
16 to 59					
White	14,525	111,781	17 (0.4)	33 (0.4)	50 (0.5)
Other	7,730	39,068	38 (0.7)	29 (0.8)	33 (0.8)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

than a high school diploma performed, on average, in the Level 1 range on all three literacy scales. Although the data must be interpreted with caution, the average proficiencies of older White adults who earned a high school diploma or GED and those who completed some postsecondary education appear to be higher than those of their peers in other racial/ethnic groups with comparable levels of education. One plausible explanation for these differences is that the quality of education varied for these populations. Differences in socioeconomic status are also likely to be a factor.

Table 2.12
Average literacy proficiencies of adults with various levels of education, by race/ethnicity and by age

Age/ race/ethnicity/ literacy scale	n	WGT N (/1000)	Average proficiencies: 0 to 12 years	High school/ GED	Post-secondary
60 and older					
White	2,756	33,009			
Prose			211 (2.4)	257 (2.2)	286 (2.5)
Document			200 (2.4)	240 (2.1)	271 (2.0)
Quantitative			207 (3.4)	257 (2.2)	292 (2.5)
Other	904	6,177			
Prose			163 (4.8)	219 (9.5)!	245 (7.1)!
Document			154 (4.1)	209 (7.2)!	234 (8.6)!
Quantitative			144 (6.4)	219 (8.5)!	241 (8.5)!
16 to 59					
White	14,525	111,781			
Prose			254 (1.8)	283 (1.1)	323 (0.9)
Document			253 (2.2)	280 (1.0)	318 (0.8)
Quantitative			253 (1.8)	285 (1.1)	323 (0.9)
Other	7,730	39,068			
Prose			195 (1.8)	243 (1.9)	278 (1.7)
Document			193 (2.1)	240 (2.2)	274 (1.5)
Quantitative			187 (1.9)	238 (2.1)	276 (1.6)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Language Use

There are small but statistically significant differences between older and younger adults with respect to the language usually spoken (table 2.13). Eighty-six percent of adults age 16 to 59 reported that they speak English most of the time, while 12 percent said they speak both English and another language and just 2 percent said they speak another language only. Older adults were slightly less likely to report that they speak only English (82 percent) and more likely to report that they usually speak English and some other language (16 percent).

Among those who speak English only, adults under 60 demonstrate consistently higher literacy proficiencies, on average, than adults age 60 and older (table 2.14). A similar pattern is found among adults who speak English and another language. Regardless of their age, adults who speak only a language other than English have substantially lower literacy proficiencies, on average, than adults who speak English only, or English and another language.

A few differences across the age groups are also found when language learned before starting school is considered (table 2.15). Adults age 60 to 69 and those age 80 and older were slightly less likely than younger adults to report that they learned only English before starting school. Further, the three older adult populations were slightly more likely than younger adults to say that they learned both English and another language.

Table 2.13
Percentages of adults who usually speak English or other languages, by age

Age			Row percentages		
	n	WGT N (/1000)	English only	English and other	Other only
16 to 59	22,286	151,314	86 (0.4)	12 (0.4)	2 (0.2)
60 and older	3,690	39,208	82 (0.9)	16 (0.8)	2 (0.3)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 2.14

Average literacy proficiencies of adults who usually speak English or other languages, by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: English only	English and other	Other only
16 to 59	22,286	151,314			
Prose			291 (0.7)	244 (2.2)	131 (2.7)!
Document			287 (0.7)	246 (2.4)	126 (3.3)!
Quantitative			289 (0.7)	250 (2.4)	125 (2.9)!
60 and older	3,690	39,208			
Prose			244 (1.6)	215 (4.8)	144 (10.0)!
Document			231 (1.5)	207 (3.2)	115 (11.7)!
Quantitative			244 (1.9)	213 (5.5)	98 (16.9)!

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

The average literacy proficiencies of older adults who learned both English and another language as young children were similar to those of adults who learned only English (table 2.16). This is not true, however, for adults below the age of 60. In this age group, those who learned only English have higher average literacy scores than those who learned English and another language. Adults age 16 to 59 who learned only English as children performed, on average, in the middle of Level 3 on all three scales; the average scores for the other groups ranged from Level 1 to the low end of Level 3. Among older respondents, even those who learned only English as children had average scores in the Level 2 range.

In both the younger and older age groups, adults who learned only a non-English language before starting school scored, on average, in Level l—below their peers who learned English only. Adults age 60 and older who learned only

Table 2.15
Percentages of adults who learned English or other languages before starting school, by age

Age	n	WGT N (/1,000)	Row percentages: English only	English and other	Other only
16 to 59	22,329	151,615	86 (0.4)	4 (0.3)	10 (0.3)
60 to 69	2,264	20,161	81 (1.2)	7 (0.9)	12 (0.7)
70 to 79	1,000	13,764	83 (1.3)	8 (1.1)	9 (0.9)
80 and older	440	5,413	79 (2.2)	9 (1.5)	11 (1.8)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 2.16
Average literacy proficiencies of adults who learned English or other languages before starting school, by age

Age/ literacy scale	n	WGT N (/1,000)	Average proficiencies: English only	English and other	Other only
16 to 59	22,329	151,615			
Prose			291 (0.7)	278 (2.7)	203 (2.4)
Document			287 (0.7)	275 (2.8)	206 (2.7)
Quantitative			289 (0.7)	276 (3.26)	210 (2.6)
60 and older	3,704	39,338			
Prose			244 (1.6)	235 (7.6)	188 (5.2)
Document			231 (1.5)	221 (5.7)	180 (4.9)
Quantitative			244 (1.9)	229 (8.5)	182 (6.4)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

a non-English language have lower average literacv proficiencies than their younger counterparts.

Since literacy tests require visual ability, and since the incidence of visual impairment increases with age, it is possible that visual impairments might explain some of the differences in literacy proficiencies between older and younger adults. Seventeen percent of the older adult population reported having a visual impairment (as defined in Appendix D), compared with only 5 percent of the under-60 population (table 2.17). Within the older adult population, the incidence of visual impairment increases with age: 11 percent of 60- to 69-year-olds, 18 percent of 70- to 79-year-olds, and 36 percent of adults 80 and older reported having a visual impairment.

Regardless of their age, visually impaired persons have lower average scores on each of the literacy scales than their peers without such impairments (table 2.18). The performance gap between those who reported an impairment and those who did not is smaller for the 80 and older Copulation than for the two younger cohorts. For example, the difference in average quantitative

Table 2.17
percentages of adults with and without visual impairments, by age

Age	n	WGT N (/1000)	Row percentages: Visual impairment	Row percentages: No visual impairment
60 and older	3,713	39,416	17 (0.7)	83 (0.7)
16 to 59	22,348	151,644	5 (0.2)	95 (0.2)
60 to 69	2,267	20,171	11 (0.8)	89 (0.8)
70 to 79	1,005	13,836	18 (1.3)	82 (1.3)
80 and older	441	5,409	36 (2.3)	64 (2.3)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 2.18
Average literacy proficiencies of adults with and without visual impairments, by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: Visual impairment	Average proficiencies: No visual impairment
60 and older	3,713	39,416		
Prose			197 (3.3)	246 (1.6)
Document			188 (3.6)	232 (1.5)
Quantitative			184 (4.0)	246 (2.1)
16 to 59	22,348	151,644		
Prose			235 (3.5)	284 (0.6)
Document			233 (3.1)	280 (0.6)
Quantitative			232 (3.2)	283 (0.6)
60 to 69	2,267	20,171		
Prose			212 (4.3)	257 (1.9)
Document			202 (4.7)	244 (1.8)
Quantitative			199 (5.3)	259 (2.2)
70 to 79	1,005	13,836		
Prose			194 (5.8)	239 (3.1)
Document			186 (5.7)	225 (2.8)
Quantitative			185 (8.3)	238 (3.3)
80 and older	441	5,409		
Prose			183 (6.1)	209 (4.7)
Document			172 (6.3)	194 (4.3)
Quantitative			167 (8.4)	205 (5.9)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

proficiencies between adults who have and those who do not have a visual impairment is about 38 points for those 80 and older, compared with 53 and 60 points, respectively, for adults age 70 to 79 and those age 60 to 69.

The presence of a visual impairment seems to have an equalizing effect on proficiency as age increases. Whereas the average literacy scores of visually impaired 60- to 69-year-olds are higher than those of their older counterparts, visually impaired adults age 70 to 79 and those age 80 and older performed comparably. Among adults without visual impairments, however, those age 60 to 69 have higher average prose, document, and quantitative scores than those age 70 to 79 who, in turn, have higher average scores than those age 80 and older.

Male and female older adults demonstrate comparable prose proficiencies, on average (table 2.19). Females were more likely than males to perform in Level 2 on this scale, while males were slightly more likely to attain Levels 4 and 5. In the areas of document and quantitative literacy, older adult males tended to outperform their female peers. On the document scale, the average score for males is 229, compared with 221 for females. Further, a larger percentage of males than females performed in Level 4 on this scale. In the area of quantitative literacy, the average proficiency of older males is 247, compared with 227 for females. Females were more likely than males to perform in Levels 1 and 2 on this scale.

When the proficiencies of older males and females are compared by age, the pattern varies across the literacy scales (table 2.20). Males age 60 to 69 tended to have higher document and quantitative scores than females of the same age, but males age 70 to 79 outperformed their female peers only on the

Table 2.19
Percentages of older adults in each literacy level and average literacy proficiencies, by sex

Literacy scale/ sex	n	WGT N (/1,000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average Proficiency
Prose								
Male	1,396	17,517	40 (2.1)	29 (2.3)	21 (1.7)	8 (1.3)	2 (0.4)	238 (2.5)
Female	2,313	21,885	38 (1.2)	35 (1.4)	22 (1.3)	5 (0.7)	0† (0.1)	237 (1.4)
Document								
Male	1,396	17,517	46 (1.8)	31 (2.2)	18 (1.5)	5 (1.0)	1 (0.2)	229 (2.3)
Female	2,313	21,885	49 (1.5)	35 (1.5)	14 (1.4)	2 (0.6)	0† (0.1)	221 (1.8)
Quantitative								
Male	1,396	17,517	36 (1.7)	24 (1.7)	24 (1.9)	12 (1.1)	4 (0.6)	247 (3.1)
Female	2,313	21,885	44 (1.5)	29 (1.5)	20 (1.1)	6 (0.9)	1 (0.3)	227 (2.2)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 2.20
Average literacy proficiencies of males and females, by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies Male	Female
60 and older	3,709	39,403		
Prose			238 (5.2)	237 (1.4)
Document			229 (2.3)	221 (1.8)
Quantitative			247 (3.1)	227 (2.2)
16 to 59	22,340	151,596		
Prose			279 (0.8)	284 (0.9)
Document			278 (0.9)	278 (0.8)
Quantitative			284 (0.9)	277 (0.9)
60 to 69	2,264	20.154		
Prose			253 (2.7)	252 (2.0)
Document			243 (2.7)	236 (2.1)
Quantitative			261 (3.6)	245 (2.6)
70 to 79	1,004	13,829		
Prose			230 (4.7)	232 (3.2)
Document			223 (3.8)	215 (3.3)
Quantitative			241 (4.7)	219 (3.8)
80 and older	441	5,419		
Prose			195 (6.5)	203 (4.3)
Document			183 (5.9)	187 (4.6)
Quantitative			198 (9.3)	188 (4.9)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center far Education Statistics, National Adult Literacy Survey, 1992.

quantitative scale. In the 80 and older age group, the differences in average literacy proficiencies between men and women disappear.

Factors such as labor force participation may contribute to the differences in literacy proficiencies between older men and women. Labor statistics show that most of today's older women have not been in the work force, and those who have worked typically held clerical jobs. Very few had opportunities to obtain professional or managerial positions which (as described later in the report) may enable individuals to strengthen their literacy.

Across the literacy scales, males and females age 60 and older had lower average proficiencies than younger males and females. For both sexes, the difference in average literacy scores between the 60 and older and under-60 populations is greatest on the document scale.

The average prose and quantitative proficiencies of younger males are 37 and 41 points higher, respectively, than those of older males. On the document scale, the proficiency difference between the two age groups is 49 points. Younger women outperformed older women by 47 points on the prose scale, 57 points on the document scale, and 50 points on the quantitative scale.

Sex differences in self-reported literacy proficiencies

Within the older population, a few significant differences are found between males and females with regard to their self-assessed literacy skills (table 2.21 and tables B2.3 and B2.4 in Appendix B). First, females age 60 and older were slightly more likely than their male peers to report that they read (69 and 63 percent, respectively) and write (62 and 56, respectively) very well. In contrast, older females were slightly less likely than males to describe themselves as doing arithmetic very well (46 and 56 percent, respectively). Similar patterns are evident in the under-60 population.

When demonstrated literacy proficiencies are compared with perceived abilities, interesting patterns appear (table 2.22). First, males who reported that they do various literacy activities very well outperformed females who reported the same level of ability. For example, the average prose scores of males who

Table 2.21
Percentages of adults by self-reported reading proficiency in English, by sex and by age

Age/ sex	n	WGT N (/1000)	Row percentages: Very well	Well	Not well/ not at all
60 and older					
Male	1,392	17,470	63 (1.6)	27 (1.3)	10 (1.0)
Female	2,304	21,816	69 (1.1)	24 (1.2)	7 (0.8)
16 to 59					
Male	10,359	74,504	67 (0.9)	25 (0.8)	8 (0.4)
Female	11,948	76,872	76 (0.7)	18 (0.6)	5 (0.3)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 2.22
Average literacy proficiencies of adults by self-reported reading proficiency in English, by sex and by age

Age/ sex/ literacy scale	n	WGT N (/1000)	Average proficiencies: Very well	Well	Not well/ not at all
60 and older					
Male	1,392	17,470			
Prose			259 (2.4)	227 (3.8)	127 (7.2)!
Document			248 (2.3)	219 (4.2)	136 (4.2)!
Quantitative			269 (2.8)	241 (5.1)	123 (8.0)!
Female	2,304	21,816			
Prose			252 (1.8)	223 (3.6)	146 (5.7)!
Document			235 (2.3)	208 (3.3)	137 (7.3)!
Quantitative			243 (2.6)	215 (5.1)	118 (7.5)!
16 to 59					
Male	10,359	74,504			
Prose			299 (0.8)	264 (1.5)	158 (3.0)
Document			297 (0.9)	264 (1.7)	162 (3.2)
Quantitative			302 (1.0)	270 (1.7)	164 (3.2)
Female	11,948	76,872			
Prose			299 (0.9)	258 (1.6)	149 (4.2)
Document			293 (0.8)	253 (1.5)	149 (4.1)
Quantitative			293 (0.8)	253 (1.7)	146 (4.3)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

reported reading and writing very well are 259 and 264, respectively, compared with 252 and 253, respectively, for females. Similarly, the average quantitative proficiency of males who reported doing arithmetic very well is 273, compared with 247 for females.

When males and females who reported doing these activities well (as opposed to very well) are compared, however, the pattern changes. For example, the average prose scores of males and females who said they read well are similar, but on the document scale, males tended to outperform females. When one compares the demonstrated literacy skills of males and females who reported writing well, both their prose and document proficiencies are about the same. Among those who said they did arithmetic well, males and females performed comparably on the quantitative and document scales as well as on the prose scale.

Between 1980 and 1990, the population of older adults grew by 34 percent in the West and by 26 percent in the South, compared with increases of 15 to 16 percent in the Northeast and Midwest. These trends are expected to continue into the early yew-s of the next century.[4] Accordingly, the South and West may face increasing pressure to address the literacy needs of the older adult population.

Regional differences in average literacy scores are found on all three scales (table 2.23). Older adults in the Midwest had lower average proficiencies than their counterparts in the West and South on all three literacy scales, and their average prose proficiencies were lower than those of older adults in the Northeast. On the other hand, older adults in the West had higher average document and quantitative scores than those in the Northeast. These findings are in contrast to the results for the under-60 population, where adults in the

Table 2.23
Average literacy proficiencies of adults, by region and by age

Age/ region	n	WGT N (/1000)	Average proficiencies: Prose	Document	Quantitative
60 and older					
Northeast	817	9,243	239 (2.1)	222 (2.4)	228 (4.0)
South	1,034	10,546	242 (3.2)	229 (2.9)	244 (4.0)
Midwest	1,220	12,408	226 (3.6)	214 (3.1)	225 (3.9)
West	643	7,238	250 (4.4)	238 (3.0)	253 (3.9)
16 to 59					
Northeast	4,608	30,592	279 (1.3)	277 (1.3)	279 (1.1)
South	6,460	34,772	291 (1.3)	287 (1.3)	290 (1.7)
Midwest	6,666	53,446	277 (1.7)	273 (1.7)	275 (1.8)
West	4,643	33,045	282 (1.6)	278 (1.7)	281 (1.9)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in Parentheses are standard errors. The true population values can be said to be within 2 standard errors of" the sample estimates with 95% certainty.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

[4] Cynthia M. Taeuber. (1992). *Sixty-Five Plus in America*. Washington, D. C.: U.S. Department of Commerce, Bureau of the Census. pp. 5.1-5.3.

South outperformed adults from the other three regions on all three literacy scales. Adults under 60 who reside in the Northeast, Midwest, and West had comparable average proficiencies.

Can the lower average literacy proficiencies of older adults in the Midwest be explained, at least in part, by a relatively high proportion of very old persons in that region? In fact, 1990 Census data indicate that the five states with the highest percentages of adults age 85 and older are Iowa, South Dakota, Nebraska, North Dakota, and Kansas—all of which are in the Midwest.[5]

Summary

For the older population as a whole, average literacy proficiencies increase as level of education increases. Older persons who had completed some postsecondary education outperformed those whose highest level of education was a high school diploma or GED, who outperformed those who left school before that point.

Older adults generally reported lower levels of education than younger adults. They were less likely to say they had completed any postsecondary education and more likely to say they had not received a high school diploma or GED.

When level of education is held constant, the performance gap between younger and older adults is reduced, but younger adults still outperformed older adults on all three literacy scales. This finding is confirmed by partition analyses, which show that age differences in average prose and quantitative scores are attributable about equally to differences in educational attainment and to other factors, while age differences in average document scores are due less to education than to other factors.

Among those who did not complete high school (but may have earned a GED), older individuals were more likely than their younger counterparts to report that they left school because of financial problems or employment. Younger adults, on the other hand, were more likely to drop out of school because of pregnancy or lack of interest.

White older adults demonstrated stronger average literacy proficiencies than their peers in other racial/ethnic groups, and they were also likely to have had more education. When level of education is held constant, White older adults tended to outperform those in other racial/ethnic groups.

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[5] Cynthia M. Taeuber. (1992). *Sixty-Five Plus in America*. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census. p. 5.3.

Most older adults reported that they usually speak English now (82 percent) and that they learned only English before starting school (79 to 83 percent). Adults age 60 and older who typically speak only English have higher average literacy proficiencies than those who usuallv speak some other language. On the other hand, the average proficiencies of older adults who learned English and another language before school are about the same as those of individuals who learned only English.

Older adults were more likely than adults under 60 to report having a visual impairment, and within the older population, the incidence of visual impairment increases with age. Regardless of the age group, visually impaired adults displayed more limited literacy skills, on average, than their peers without such impairments.

Although the average prose proficiencies of males and females age 60 and older are equivalent, older males tended to outscore their female peers on the document and quantitative literacy scales. Older adults in the Midwest tended to have lower literacy proficiencies than those residing in other regions of the country.

CHAPTER 3

Employment, Civic Participation, and Economic Status as They Relate to Literacy in the Older Adult Population

National Adult Literacy Survey respondents were asked to provide information about their labor force participation, civic involvement, and annual household income. Using these data, this chapter constructs a detailed picture of the employment, civic, and economic status of the nation's older adults, and explores connections between these aspects of life and individuals' literacy. The results indicate that older adults who are active in the labor force, those who volunteer and vote, and those with higher incomes tend to display stronger literacy skills than their peers.

Retirement and Labor Force Participation

Nearly one-quarter (23 percent) of adults age 60 and older reported that they were employed either full- or part-time the week before the survey; 2 percent were unemployed, laid off, or looking for work; 43 percent were out of the labor force (in school or keeping house); 32 percent were retired; and 3 percent were retired *and* doing volunteer work (table 3.1).[1]

In contrast, roughly three-quarters of adults under 60 (74 percent) were employed, while 17 percent were out of the labor force, 9 percent were unemployed, and only O to 1 percent were retired, or retired and volunteering. Although adults age 60 and older were less likely than younger persons to be unemployed, unemployment creates serious problems for older adults. Unemployed older individuals tend to stay out of the work force longer than their younger counterparts. As a result, many become discouraged in looking for work and drop out of the labor market.[2]

The percentage of adults who were employed decreases with age: 70 percent of adults age 55 to 59, 47 percent of those age 60 to 64, 24 percent of those age 65 to 69, and 10 percent of those age 70 and older reported being

[1] Typically, retired individuals are classified as being out of the labor force. In this report, however, adults who reported that they were "retired" the week before the survey are labeled as such, and adults who reported that they were keeping house or in school are classified as "out of the labor force." The "retired" category includes both the retired who volunteer and those who do not.

[2] U.S. Department of Health and Human Services. (1991). Aging *America*. Washington, DC: Department of Health and Human Services. pp. 91 and 104.

Table 3.1
Percentages of adults in various labor force groups, by age

Age	n	WGT N (/1000)	Row percentages: Employed	Un-employed	Out of labor force	All retired	Retired volunte
60 and older	3,631	38,746	23 (0.7)	2 (0.3)	43 (1.4)	32 (1.4)	3 (0.4)
16 to 59	20,910	148,571	74 (0.4)	9 (0.3)	17 (0.4)	1 (0.1)	0† (0.0)
55 to 59	1,369	9,437	70 (1.7)	5 (0.7)	20 (1.5)	5 (0.8)	1 (0.2)
60 to 64	1,456	9,417	47 (1.8)	3 (0.5)	31 (1.7)	19 (1.7)	2 (0.6)
65 to 69	746	10,331	24 (2.1)	2 (0.6)	42 (2.7)	32 (2.3)	3 (0.7)
70 and older	1,429	18,999	10 (0.9)	1 (0.4)	50 (1.7)	39 (1.9)	4 (0.7)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

employed the week before the survey. The percentage of individuals who were unemployed also declines slightly across the age groups, from 5 percent of adults age 55 to 59 to 1 percent of adults age 70 and older. In contrast, the percentage of adults who were out of the labor force increases with age, from 20 percent of 55- to 59-year-olds, to 31 percent of 60- to 64-year-olds, 42 percent of 65- to 69-year-olds, and 50 percent of adults age 70 and older. Thus, there is a sizable pool of older adults who have been unable to find work and who do not consider themselves retired, for whatever reason.

The percentage of adults who are retired also increases with age: 5 percent of 55- to 59-year-olds, 19 percent of 60- to 64-year-olds, 32 percent of 65- to 69-year-olds, and 39 percent of adults age 70 and older. These percentages would be slightly higher if the percentages who were retired and volunteering were added in.

On each literacy scale, older adults who were employed and those who were retired and volunteering demonstrated comparable average proficiencies. These two groups, in turn, outperformed older adults who were out of the labor force or retired (table 3.2). On the quantitative literacy scale, they also outperformed individuals who were unemployed.

The differences in average literacy proficiencies by employment status are reflected in the distributions of adults across the literacy levels. On the prose scale, for example, about one-quarter of adults age 60 and older who were employed and of those who were retired and doing volunteer work performed in Level 1. Older adults who were out of the labor force (40 percent) or retired (47 percent) were more likely to score in this literacy level. (Although 46 percent of unemployed older adults performed in Level 1, when compared with the percentages who were employed or retired and volunteering, the differences do not reach statistical significance.) In all, 56 percent of those who

Table 3.2
Percentages of older adults in each literacy level and average literacy proficiencies, by labor force group

Literacy scale/ labor force status	n	WGT N (/1000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average Proficiency
Prose								
Employed	954	8,806	24 (2.2)	32 (2.1)	30 (1.9)	12 (1.5)	2 (0.5)	263 (3.0)
Unemployed	82	622	46 (1 1.3)	24 (10.3)	23 (6.9)	6 (3.0)	1 (1.0)	235 (12.7)
Out of labor force	1,619	16,737	40 (1.7)	35 (1.9)	20 (1.5)	4 (0.8)	1 (0.3)	235 (2.0)
All retired	976	12,582	47 (2.4)	30 (2.2)	18 (2.1)	5 (1.5)	1 (0.4)	225 (3.3)
Retired/volunteer	90	1,241	24 (8.3)	41 (10.3)	26 (6.4)	8 (4.4)	0† (0.9)	256 (6.6)
Document								
Employed	954	8,806	32 (2.1)	36 (2.1)	25 (2.2)	7 (1.4)	1 (0.3)	249 (2.6)
Unemployed	82	622	48 (7.6)	35 (8.4)	11 (7.2)	5 (2.8)	1 (1.1)	222 (8.6)
Out of labor force	1,619	16,737	51 (1.7)	34 (1.7)	13 (1.4)	2 (0.7)	0† (0.1)	219 (2.0)
All retired	976	12,582	53 (2.9)	30 (2.5)	14 (1.6)	3 (0.8)	0† (0.2)	216 (3.3)
Retired/volunteer	90	1,241	30 (8.0)	40 (10.3)	26 (5.2)	4 (2.7)	0† (0.0)	249 (6.3)
Quantitative								
Employed	954	8,806	23 (2.2)	30 (1.9)	30 (2.5)	14 (1.7)	4 (0.8)	268 (3.2)
Unemployed	82	622	47 (1 0.7)	26 (10.4)	20 (6.1)	6 (3.6)	2 (1.2)	222 (1 1.8)
Out of labor force	1,619	16,737	45 (1.8)	29 (2.1)	19 (1.6)	5 (0.8)	1 (0.5)	227 (2.7)
All retired	976	12,582	45 (2.3)	23 (1.9)	21 (1.8)	9 (1.3)	2 (0.6)	228 (4.0)
Retired/volunteer	90	1,241	24 (10.6)	33 (13.9)	29 (7.7)	14 (5.1)	1 (1.9)	268 (7.1)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

were employed, 65 percent of those who were retired and volunteering, and 70 percent or more of those who were unemployed, out of the labor force, or retired scored in the two lowest levels of prose literacy.

The pattern for the quantitative scale is similar, although the percentages of older adults who were unemployed (47 percent), out of the labor force, or retired (both 45 percent) performing in the lowest level are about double the percentages of those who were employed (23 percent) or retired and volunteering (24 percent) scoring in this level.

As suggested by the relatively low average document scores of older adults, the pattern of results for this literacy scale varies slightly from that for the other two scales. Employed older adults (32 percent) were still less likely than those who were either out of the labor force or retired (51 and 53 percent, respectively) to perform in the lowest level of document literacy. When the latter two groups are compared with older adults who were retired and volunteering, however, the differences do not reach statistical significance. Further, 68 to 70 percent of those who were employed or retired and volunteering performed in Level 1 or 2 on the document scale, and more than 80 percent of those who were unemployed, out of the labor force, or retired scored in these levels.

The percentage of older adults who scored in Level 4 is small compared with the percentages who scored in the lower levels. Yet, it is interesting to note that on the prose and quantitative scales, employed older adults were more likely than their peers who were out of the labor force or retired to perform in this level. For example, on the quantitative scale, 14 percent of employed older adults were in Level 4, compared with 5 percent of those who were out of the labor force and 9 percent of those who were retired. Further, employed older adults were more likely than unemployed older adults to perform in Level 4 on this literacy scale.

Another way to look at the relationship between literacy and employment status is to determine the percentages of older adults in each literacy level who were employed, unemployed, out of the labor force, retired, or retired and volunteering. As shown in table 3.3, older adults' literacy skills are, in fact, related to their involvement in the labor force. That is, as the literacy level increases, the percentage of older adults who were employed increases, and the percentage who were out of the labor force generally decreases.

On all three literacy scales, nearly half the older adults who performed in Level 1 or 2 reported being either unemployed or out of the labor force. In contrast, about 30 percent of the older adults who scored in Level 4 are in these categories.

A closer look at these data may be helpful. On the quantitative scale, for example, only 13 percent of the older adults who scored in Level 1 were employed, compared with 46 percent of those performing in Level 5. In contrast, nearly half the older adults in Level 1 (48 percent) but only about one-quarter (23 percent) of those in Level 5 were out of the labor force.

Table 3.3
Percentages of older adults in each literacy level in various labor force groups

Literacy scale/ labor force status	n	WGT N (/1000)	Level 1	Level 2	Level 3	Level 4	Level 5	Average Proficiency
			Column percentages					
Prose								
Employed	954	8,806	14 (1.9)	22 (1.9)	32 (2.1)	45 (4.3)	---	263 (3.0)
Unemployed	82	622	2 (8.6)	1 (7.0)	2 (6.4)	2 (2.7)	---	235 (12.7)
Out of labor force	1,619	16,737	45 (1.6)	47 (1.8)	39 (1.6)	29 (1.9)	---	235 (2.0)
All retired	976	12,582	39 (2.4)	29 (2.1)	27 (2.1)	24 (3.9)	---	225 (3.3)
Retired/volunteer	90	1,241	2 (6.1)	4 (6.2)	4 (5.3)	4 (3.5)	---	256 (6.6)
Document								
Employed	954	8,806	15 (2.1)	25 (2.0)	35 (2.4)	45 (3.2)	---	249 (2.6)
Unemployed	82	622	2 (6.3)	2 (8.0)	1 (5.4)	2 (2.1)	---	222 (8.6)
Out of labor force	1,619	16,737	47 (1.7)	45 (2.0)	35 (2.3)	25 (5.2)	---	219 (2.0)
All retired	976	12,582	36 (2.7)	29 (2.2)	29 (2.0)	28 (3.8)	---	216 (3.3)
Retired/volunteer	90	1,241	2 (5.7)	4 (7.0)	5 (4.6)	4 (2.7)	---	249 (6.3)
Quantitative								
Employed	954	8,806	13 (1.9)	25 (1.9)	31 (2.3)	36 (2.8)	46 (6.9)	268 (3.2)
Unemployed	82	622	2 (8.5)	2 (6.8)	1 (5.8)	1 (3.3)	2 (1.1)	222 (11.8)
Out of labor force	1,619	16,737	48 (1.8)	47 (2.5)	38 (1.8)	27 (2.9)	23 (5.4)	227 (2.7)
All retired	976	12,582	37 (2.3)	27 (2.1)	30 (1.8)	36 (2.4)	29 (3.2)	228 (4.0)
Retired/volunteer	90	1,241	2 (5.6)	4 (7.0)	4 (6.5)	5 (4.3)	1 (2.4)	268 (7.1)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

--- Sample size is too small to provide a reliable proficiency estimate.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Civic Participation

Survey participants were asked several questions about their civic and community involvement. Specifically, they were asked whether they had done any volunteer work in the last week, and whether they had voted in a national or state election within the past five years. The results indicate that civic and community involvement are strongly associated with literacy among older adults. Persons age 60 and older with higher literacy proficiencies are, on average, more likely to vote and to perform volunteer work, and thus play a more active role in their communities.

Volunteer activity

Fourteen percent of the older adult population reported that they had volunteered in the last week, compared with 10 percent of the younger population (table 3.4). These figures may underestimate volunteer activity, due to the time frame used in the National Adult Literacy Survey question. Other surveys that address this issue typically use an expanded time frame (e.g., the last month, the last year, ever) in estimating volunteer activity.[3]

Table 3.4
percentages of adults, by volunteer involvement and by age

Age/ volunteer involvement	n	WGT N (/1000)	Row percentages Yes	No
60 and older	3,714	39,435	14 (0.7)	86 (0.7)
16 to 59	22,377	151,854	10 (0.3)	90 (0.3)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

[3] S.M. Chambre. (1993). "Volunteerism by Elders: Past Trends and Future Prospects," *The Gerontologist*, 33 (2).

Older persons who had recently volunteered demonstrated stronger literacy skills, on average, than those who had not (table 3.5). On the prose and quantitative scales, the average scores of volunteers are about 260, compared with about 230 for those who had not volunteered, while on the document scale the corresponding figures are 247 and 221, respectively. The same general pattern is found among younger persons.

Table 3.5
Average literacy proficiencies of adults, by volunteer involvement and by age

Age/ volunteer involvement	n	WGT N (/1000)	Average proficiencies: Prose	Document	Quantitative
60 and older					
Yes	571	5,452	262 (2.8)	247 (2.8)	261 (4.1)
No	3,143	33,983	234 (1.7)	221 (1.7)	232 (2.2)
16 to 59					
Yes	2,305	15,254	309 (1.5)	301 (1.5)	304 (1.3)
No	20,072	136,601	278 (0.6)	275 (0.7)	278 (0.7)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Voting

More than 80 percent of the older adult population reported having voted in a national or state election in the United States within the past five years, compared with about 62 percent of the younger population (table 3.6). These percentages may be slightly elevated, as some respondents who did not vote may have reported doing so,[4] but they are relatively consistent with data from other sources.[5]

Older voters tended to perform better in the literacy assessment than their non voting peers. On each of the three scales the average older voter performed in the Level 2 range, while the average non voter in this age group scored in the Level 1 range (table 3.7). For example, the average prose score of older voters is 245, compared with 203 for non voters. Within the under-60 population, voters had average scores in the Level 3 range, while non voters tended to score in the range for Level 2.

Table 3.6
Percentages of adults, by voting involvement and by age

Age/ voting involvement	n	WGT N (/1000)	Row percentages Yes	No
60 and older	3,625	38,663	84 (0.6)	16 (0.6)
16 to 59	19,475	137,225	62 (0.5)	38 (0.5)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

[4] S. Presser. (Winter 1990), "Can Context Changes Reduce Vote Overreporting?" *Public Opinion Quarterly*

[5] For example, see Bureau of Census. (1989). Current *Population Reports*, *series* p.20, no. 453.

Table 3.7
Average literacy proficiencies of adults, by voting involvement and by age

Age/ voting involvement	n	WGT N (/1000)	Average proficiencies: Prose	Document	Quantitative
60 and older					
Yes	3,010	32,436	245 (1.6)	231 (1.6)	245 (2.2)
No	615	6,227	203 (3.0)	196 (3.5)	195 (3.6)
16 to 59					
Yes	12,474	84,942	300 (0.8)	294 (0.8)	299 (0.8)
No	7,001	52,283	263 (1.1)	262 (1.0)	262 (1.2)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Annual Household Income

The economic status of older Americans has improved substantially since the 1970s. As a result, the poverty rate among older adults (roughly 12 percent in 1990) is similar to that among adults age 25 to 64. Still, not all older persons have benefited equally from these gains. There are, for example, significant income disparities between older adult subpopulations defined by age, race/ethnicity, sex, marital status, level of education, and work history. Further, older adults are more likely than younger persons to be "near poor."[6]

National Adult Literacy Survey participants were asked to report their total household income from all sources for 1991, the year before the survey.[7] These sources might include pensions, Social Security, and earnings.

Older adults (46 percent) were more likely than those under age 60 (25 percent) to report annual household incomes of less than $20,000 (table 3.8).

[6] Cynthia M. Taeuber. (1992). *Sixty-Five Plus in America*. Washington, D. C.: U.S. Department of Commerce, Bureau of the Census. pp. 4.6-4.7.

[7] Respondents were told to consider as family anyone who fives in their household and who is related to them by blood, marriage, or adoption.

Table 3.8
Percentages of adults with various levels of annual household income, by age

Age	n	WGT N (/1000)	Less than $10,000	$10,000 to $19,999	$20,000 to $39,999	$40,000 or more
			Row percentages			
60 and older	2,589	27,036	20 (1.2)	26 (1.0)	31 (1.4)	23 (1.1)
16 to 59	16,247	113,246	10 (0.4)	15 (0.4)	31 (0.5)	44 (0.7)
60 to 69	1,661	14,773	15 (1.0)	22 (1.1)	33 (1.7)	30 (1.4)
70 to 79	667	9,103	21 (1.8)	32 (1.8)	30 (2.2)	17 (1.9)
80 and older	261	3,160	37 (3.9)	32 (2.7)	20 (2.6)	11 (2.6)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population' values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

The same percentages of these two age groups (31 percent) reported incomes of $20,000 to $39,999, and a lower percentage of older adults (23 percent) than younger adults (44 percent) reported incomes of $40,000 or more.

Generally, as age increases, the percentages of older adults in the lower income categories increase. Adults age 80 and older (37 percent) were more likely than those age 70 to 79 (21 percent) to report that their household income for the year before the survey was less than $10,000, and those age 70 to 79 were more likely than those age 60 to 69 (15 percent) to report incomes in this category.

The literacy skills and household incomes of older adults appear to be related. The higher their income, the higher their average literacy proficiencies (table 3.9). For example, the average prose score of older adults from households with incomes of $40,000 or more (279) is higher than that of adults from households with incomes of $20,000 to $39,999 (258), which in turn is higher than that of adults from households with incomes between $10,000 and $19,999 (229). Older adults from households with less than $10,000 of income had the lowest average prose score of all the groups (204). The pattern is highly similar for the document and quantitative scales.

The relationship between literacy and income is found within each age group in the older adult population. Among 60- to 69-year-olds, there is a step-by-step increase in average literacy scores with each increase in income level. For example, the average prose proficiencies of 60- to 69-year-olds rise from 212 to 288 across the income groups. For the 70 to 79 age group, proficiencies rise until the $20,000 to $39,000 income bracket and then level off. Among those with annual incomes below $10,000 and those with incomes of $20,000 to

Table 3.9

Percentages of older adults in each literacy level and average literacy proficiencies, by annual household income

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: Less than $10,000	$10,000 to $19,999	$20,000 to $39,999	$40,000 or more
60 and older	2,589	27,036				
Prose			204 (4.0)	229 (3.1)	258 (3.3)	279 (3.6)
Document			189 (3.4)	216 (3.4)	242 (2.7)	266 (3.1)
Quantitative			189 (4.1)	231 (4.0)	261 (3.4)	287 (4.0)
16 to 59	16.247	113.246				
Prose			249 (3.1)	265 (1.9)	284 (1.0)	311 (1.0)
Document			245 (3.3)	261 (1.9)	281 (1.1)	305 (0.8)
Quantitative			241 (3.5)	264 (1.8)	284 (1.0)	311 (0.9)
60 to 69	1,661	14,773				
Prose			212 (4.8)	245 (2.6)	261 (3.7)	288 (3.0)
Document			198 (5.3)	232 (3.4)	248 (2.8)	274 (2.6)
Quantitative			201 (5.4)	246 (3.8)	265 (3.5)	294 (3.6)
70 to 79	667	9,103				
Prose			203 (5.4)	222 (5.2)	258 (4.6)	263 (11.1)!
Document			188 (4.5)	209 (5.4)	241 (4.1)	255 (9.7)!
Quantitative			185 (6.4)	223 (6.0)	265 (5.7)	276 (12.1)!
80 and older	261	3,160				
Prose			192 (6.5)!	201 (7.7)!	---	---
Document			175 (4.9)!	185 (8.6)!	---	---
Quantitative			172 (6.3)!	207 (9.8)!	---	---

n = sample size WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

--- Sample size is too small to provide a reliable proficiency estimate.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

$39,999, adults age 60 to 69 and 70 to 79 performed comparably, on average. In the other two income brackets, however, 60- to 69-year-olds tended to outperform 70- to 79-year-olds.

The proficiency level results show that the percentage of older adults in Level 1 decreases as household income increases (table 3.10). On the prose scale, for example, 64 percent of older adults with household incomes below $10,000 scored in Level 1. The percentage drops to 44 percent among those with household incomes of $10,000 to $19,999, to 25 percent for the $20,000 to $39,999 income group, and to 14 percent for those with household incomes of $40,000 or more.

Table 3.10
Literacy levels and average literacy proficiencies of older adults with various levels of annual household income

Literacy scale/ annual income	n	WGT N (/1000)	Row percentages Level 1	Level 2	Level 3	Level 4	Level 5	Average Proficiency
Prose								
Less than $10,000	664	5,355	64 (2.8)	27 (2.6)	9 (1.8)	1 (0.5)	0†(0.1)	204 (4.0)
$10,000 to $19,999	635	7,135	44 (2.9)	36 (3.0)	17 (1.9)	3 (0.8)	0†(0.1)	229 (3.1)
$20,000 to $39,999	728	8,293	25 (2.9)	37 (2.8)	30 (2.1)	8 (1.6)	1 (0.5)	258 (3.3)
$40,000 or more	562	6,254	14 (1.9)	29 (3.0)	37 (3.3)	16 (2.6)	4 (0.8)	279 (3.6)
Document								
Less than $10,000	664	5,355	72 (3.0)	22 (2.9)	5 (1.4)	0†(0.3)	0†(0.1)	189 (3.4)
$10,000 to $19,999	635	7,135	54 (2.8)	34 (3.5)	11 (2.7)	1 (0.6)	0†(0.2)	216 (3.4)
$20,000 to $39,999	728	8,293	34 (2.5)	40 (2.3)	21 (2.4)	4 (1.2)	0†(0.3)	242 (2.7)
$40,000 or more	562	6,254	18 (2.3)	38 (2.7)	32 (2.3)	10 (2.0)	1 (0.7)	266 (3.1)
Quantitative								
Less than $10,000	664	5,355	69 (3.2)	21 (2.9)	9 (1.7)	2 (1.0)	0†(0.2)	189 (4.1)
$10,000 to $19,999	635	7,135	43 (3.2)	31 (2.4)	21 (2.3)	5 (1.2)	0†(0.3)	231 (4.0)
$20,000 to $39,999	728	8,293	25 (2.1)	31 (2.2)	30 (2.6)	12 (1.5)	2 (1.1)	261 (3.4)
$40,000 or more	562	6,254	13 (2.4)	27 (3.1)	36 (3.0)	19 (3.0)	6 (1.4)	287 (4.0)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Level of education and annual household income

The survey results indicate a clear relationship between education and household income: less educated older adults were far more likelv than their better educated peers to report low levels of annual household income (table 3.11). Two-thirds of older adults who had not earned a high school diploma reported annual household incomes under $20,000, compared with 41 percent of those with a high school diploma or GED and 23 percent of those with some postsecondary education. Within each level of education, older adults were more likely than younger adults to have annual incomes below $20,000.

Further, there is a relationship between literacy proficiency and household income within each education level (table 3.12). When the skills of individuals with the same level of education are compared, older adults with household incomes of $20,000 or more have higher average proficiencies than those with incomes below $20,000. Among older adults who had not completed high school, for example, the prose proficiencies of those with household incomes of $20,000 or more is 223, compared with 197 for those with household incomes of less than $20,000. For older adults with a high school diploma or GED, the corresponding prose proficiencies are 265 and 245, respectively; and for older adults with a postsecondary education, they are 293 and 263, respectively.

Table 3.11
Percentages of adults with more or less than $20,000 of annual household income, by level of education and by age

Age/ level of education	n	WGT N (/1000)	Row percentages: Less than $20,000	Row percentages: $20,00 or more
60 and older				
O to 12 years	965	11,177	67 (2.2)	33 (2.2)
High school/GED	686	7,271	41 (2.2)	59 (2.2)
Postsecondary	933	8,482	23 (1.9)	77 (1.9)
16 to 59				
O to 12 years	2,640	20,199	48 (1.4)	52 (1.4)
High school/GED	4,510	35,713	27 (0.9)	73 (0.9)
Postsecondary	9,073	57,131	16 (0.8)	84 (0.8)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 3.12

Average literacy proficiencies of adults with more or less than $20,000 of annual household income, by level of education and by age

Age/ level of education/ literacy scale	n	WGT N (/1000)	Average proficiencies: Less than $20,000	Average proficiencies: $20,00 or more
60 and older				
O to 12 years	965	11,177		
Prose			197 (3.3)	223 (4.7)
Document			184 (3.0)	214 (5.2)
Quantitative			188 (4.1)	230 (6.0)
High school/GED	686	7,271		
Prose			245 (3.9)	265 (4.1)
Document			228 (3.8)	249 (3.6)
Quantitative			242 (4.4)	270 (4.1)
Postsecondary	933	8,482		
Prose			263 (3.8)	293 (3.1)
Document			249 (3.7)	278 (2.5)
Quantitative			267 (4.5)	299 (3.4)
16 to 59				
0 to 12 years	2,640	20,199		
Prose			213 (2.2)	247 (2.6)
Document			209 (2.2)	246 (2.7)
Quantitative			207 (2.3)	246 (2.4)
High school/GED	4,510	35,713		
Prose			266 (2.0)	283 (1.0)
Document			262 (1.9)	278 (1.0)
Quantitative			264 (2.0)	283 (1.1)
Postsecondary	9,073	57,131		
Prose			302 (2.3)	321 (0.9)
Document			297 (2.5)	315 (0.8)
Quantitative				

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Within each income category, the average literacy scores of older adults increase with each successive level of education. For example, among those with annual household incomes below $20,000, the quantitative proficiency of older adults without a high school diploma is 188, compared with 242 for those with a high school diploma or GED, and 267 for those with some postsecondary education. It is noteworthy that the only group of older adults to perform in Level 1 on all three scales is school dropouts with annual household incomes below $20,000.

The relationship between adults' age, level of education, and annual household income is quite complex. When the literacy skills of older and younger adults in the same income bracket and with the same level of education are compared, the younger group outperforms the older group on each proficiency scale. Further, on the prose and quantitative scales, older adults who have annual incomes below $20,000 and have completed some postsecondary education demonstrate about the same average proficiencies as younger persons who are in the same income bracket but who have a high school diploma or GED.

Race and annual household income

Other studies have found that Black older adults tend to have lower incomes than White older adults.[8] This general pattern also appears in the National Adult Literacy Survey data. Approximately two-thirds of Black older adults (68 percent) reported annual household incomes below $20,000, compared with 44 percent of White older adults (table 3.13). In the Black and White populations alike, adults age 60 and older were more likely than those under 60 to report this low level of household income.

Table 3.13
Percentages of adults with more or less than $20,000 of annual household income, by race and by age

Age/ race	n	WGT N (/1000)	Row percentages: Less than $20,000	Row percentages: $20,00 or more
60 and older				
White	2,007	23,240	44 (1.7)	56 (1.7)
Black	385	2,004	68 (3.1)	32 (3.1)
16 to 59				
White	11,396	87,158	20 (0.7)	80 (0.7)
Black	2,583	11,101	41 (1.5)	59 (1.5)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

[8] U.S. Department of Health and Human Services. (1991). *Aging America,* Washington, DC: Department of Health and Human Services. p. 51.

Regardless of race/ethnicity, there is a strong relationship between household income and literacy in the older adult population (table 3.14). Among White older adults, the average scores of those with annual household incomes at or above $20,000 are 44 to 54 points higher than those of their peers with incomes below $20,000. Similarly, Black older adults in the upper income bracket outperformed their peers in the lower income bracket by 47 to 60 points across the scales. Interestingly, the performance gaps between adults in these two income levels are smaller in the under-60 age groups than in the older groups. Among White adults under 60, for example, individuals with household incomes of $20,000 or more outperformed those with incomes below $20,000 by 26 to 30 points across the literacy scales. Similarly, for the

Table 3.14
Average literacy proficiencies of adults with more or less than $20,000 of annual household income, by race and by age

Age/ race/ literacy scale	n	WGT N (/1000)	Average proficiencies: Less than $20,000	Average proficiencies: $20,00 or more
60 and older				
White	2,007	23,240		
Prose			228 (2.6)	272 (2.3)
Document			213 (2.8)	257 (2.1)
Quantitative			225 (3.4)	278 (2.8)
Black	385	2,004		
Prose			187 (4.8)	234 (8.6)!
Document			173 (3.9)	222 (7.9)!
Quantitative			165 (5.5)	225 (10.3)!
16 to 59				
White	11,396	87,158		
Prose			280 (2.1)	308 (0.9)
Document			277 (2.4)	303 (0.8)
Quantitative			279 (2.0)	309 (0.9)
Black	2,583	11,101		
Prose			235 (2.1)	264 (2.0)
Document			227 (2.1)	257 (2.0)
Quantitative			220 (2.2)	255 (2.1)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

under-60 Black population, adults in the upper income bracket outperformed those in the lower bracket by 29 to 35 points across the scales.

At each income level, White older adults had higher average literacy proficiencies than Black older adults. (The data for Black older adults in the $20,000 or more category should be interpreted with caution, however, due to the small sample size.) For example, the average prose score of White older adults with annual household incomes below $20,000 is 228, compared with 187 for Black older adults with the same level of income.

Sex and annual household income

Table 3.15 shows the percentages of males and females with various levels of annual household income. Females age 60 and older were more likely than their male peers to have annual household incomes below $10,000 and of $10,000 to $19,999. In turn, older males (64 percent) were more likely than older females (44 percent) to have annual incomes of $20,000 or more. In sum, more than half the female older adults reported having annual household incomes below $20,000, compared with about one-third of the male older adults. The lower incomes of older women are largely a result of their depending on men for their economic base, and of their changing status with

Table 3.15
Percentages of adults with various levels of annual household income, by sex and by age

Age/ sex	n	WGT N (/1000)	Row percentages: Less than $10,000	$10,00 to $19,999	$20,000 or more
60 and older					
Male	1,078	13,561	13 (1.2)	23 (1.5)	64 (1.6)
Female	1,508	13,454	27 (1.5)	29 (1.4)	44 (2.0)
16 to 59					
Male	7,252	56,254	8 (0.6)	14 (0.6)	77 (0.8)
Female	8,971	56,827	12 (0.5)	16 (0.6)-	72 (0.8)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

old age.[9] Widowed or divorced older women are particularly likely to have low incomes because of the loss of their spouse's income or pension.

When compared with the under-60 population, male and female older adults were more likely to report having incomes that were either below $10,000 or between $10,000 and $19,999. The difference between the two age groups is more pronounced, however, among females: more than twice as many older women than younger women reported incomes below $10,000.

Older males and females with comparable levels of household income tended to display comparable literacy proficiencies (table 3.16). An exception occurs at the $10,000 to $19,999 income level, however, where the average prose score of older women is higher than that of men.

Table 3.16
Average literacy proficiencies of adults with various levels of annual household income, by sex and by age

Age/ sex/ literacy scale	n	WGT N (/1000)	Average proficiencies: Less than $10,000	$10,00 to $19,999	$20,000 or more
60 and older					
Male	1,078	13,561			
Prose			192 (8.5)!	217 (4.6)	265 (3.4)
Document			181 (6.4)!	210 (5.0)	253 (2.7)
Quantitative			183 (9.0)!	228 (5.7)	278 (3.7)
Female	1,508	13,454			
Prose			210 (2.9)	239 (3.5)	270 (3.0)
Document			194 (3.4)	221 (4.1)	253 (2.9)
Quantitative			192 (3.9)	234 (5.2)	264 (3.4)
16 to 59					
Male	7,252	56,254			
Prose			246 (4.6)	258 (2.8)	298 (0.9)
Document			244 (4.8)	256 (2.9)	295 (1.0)
Quantitative			243 (4.7)	261 (2.8)	303 (1.1)
Female	8,971	56,827			
Prose			251 (3.2)	272 (2.7)	302 (1.1)
Document			245 (3.2)	266 (2.5)	295 (0.9)
Quantitative			240 (3.6)	266 (2.6)	296 (1.0)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

[9] U.S. Department of Health and Human Services. (1991). *Aging America*. Washington, DC: Department of Health and Human Services, p. 46.

The literacy proficiencies of males as well as females tend to increase as income level increases, regardless of age. For example, older females with annual household incomes below $10,000 have an average prose score of 210, compared with 239 for older females with incomes of $10,000 to $19,999, and 270 for older females with incomes of $20,000 or more.

The employment and retirement rates for adults age 60 and older follow predictable patterns. The percentages of older adults who were employed or unemployed decrease with age, while the percentage who were retired increases with age. The percentage who were out of the labor force also rises with age.

On each literacy scale, older adults who were employed and those who were retired and volunteering had about the same literacy scores, on average. These two groups tended to outperform those who were out of the labor force or retired. As the literacy level increases, the percentage of older adults who were employed also increases, while the percentage who were out of the labor force decreases.

Fourteen percent of older adults reported that they had volunteered in the past week, while 84 percent said they had voted in a national or state election in the past five years. Literacy proficiency is related to civic involvement in the older adult population. Adults age 60 and older who said they had recently volunteered and voted demonstrated stronger literacy skills, on average, than those who had not engaged in such activities.

Older adults were more likely than younger adults to report annual household incomes below $20,000. Higher levels of household income are related to stronger literacy proficiencies, on average. Among 60- to 69-year-olds, for example, there is a step-by-step increase in average literacy scores with each increase in income level.

Older adults who had not completed high school reported lower annual incomes, on average, than those whose highest level of education was a high school diploma or GED or some postsecondary education. Further, within the older adult population, Black adults were more likely than White adults, and women were more likely than men, to report low annual incomes. When level of income is held constant, the average literacy scores of Black adults are lower than those of White adults, but the average scores of men and women are comparable.

CHAPTER 4

Literacy Practices and Proficiencies in the Older Adult Population

Survey participants were asked a series of questions about their literacy practices, such as where they learned to read various types of materials, how often they use the library, how often they read a newspaper, how many magazines they read on a regular basis, and how frequently they engage in various types of personal and work-related literacy activities. The results make it possible to explore connections between older adults' everyday literacy activities and their demonstrated prose, document, and quantitative skills.

Acquisition of Literacy Skills

Survey respondents were asked where they primarily learned to read newspapers, magazines, or books; to read graphs, diagrams, or maps; to fill out forms; and to write letters, memos, or reports. The choices were: at school, at home or in the community, at work, did not learn, and "other."

Most people reported learning to read newspapers, magazines, and books at school, but a large percentage indicated that they learned this skill at home (table 4.1). The percentages vary slightly by age, with the younger age group more likely than the older group (62 and 55 percent, respectively) to report learning to read these materials at school. On the other hand, a greater percentage of the older population than the younger population reported learning to read prose materials at home (42 percent, compared with 36 percent).

Reading documents (such as graphs, diagrams or maps) is a skill acquired primarily in school, regardless of age cohort. Older persons, however, were more likely than younger persons to report never having learned this particular skill. More than four out of five persons age 16 to 59 (82 percent) reported having learned to read documents in school, compared with 68 percent of older individuals. While similar percentages of adults under age 60 and those 60 and older reported learning these skills at home (9 and 13 percent, respectively) and work (6 to 7 percent), only 3 percent of those under 60 reported never learning to read documents, compared with 10 percent of the older population.

Table 4.1
Percentages of Adults by Place Where They Learned to Read Different Materials, by Age Group

Type of material/ age group	n	WGT N (/1000)	School	Home	Work	Did not learn	Other
			Row percentages				
Newspapers, books, magazines							
60 and older	3,692	39,315	55 (1.0)	42 (1.0)	1 (0.3)	2 (0.3)	0†(0.1)
16 to 59	21,218	150,865	62 (0.5)	36 (0.5)	1 (0.1)	1 (0.1)	0†(0.0)
Graphs, maps							
60 and older	3,693	39,327	68 (1.0)	13 (0.8)	7 (0.5)	10 (0.7)	2 (0.3)
16 to 59	21,210	150,785	82 (0.4)	9 (0.3)	6 (0.2)	3 (0.1)	1 (0.1)
Forms							
60 and older	3,696	39,387	48 (1.2)	23 (0.8)	21 (0.8)	6 (0.5)	2 (0.4)
16 to 59	21,209	150,820	63 (0.6)	18 (0.4)	16 (0.4)	2 (0.1)	1 (0.1)
Letters							
60 and older	3,694	39,369	62 (1.0)	24 (0.9)	11 (0.6)	3 (0.3)	1 (0.2)
16 to 59	21,505	150,836	75 (0.4)	13 (0.3)	10 (0.3)	1 (0.1)	0†(0.0)

n = sample size WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Adults in each age group were most likely to report learning how to fill out forms in school. While 63 percent of adults under 60 reported learning this skill in school, however, this is true of only about half the older population. In contrast, 23 percent of older adults learned how to fill out forms at home, compared with 18 percent of those under age 60. Twenty-one percent of the older group learned this skill at work, as opposed to 16 percent of the younger group. Six percent of those over the age of 60 reported never having learned to fill out forms, compared with 2 percent of younger persons.

The place where letter writing was learned varies by age. Three-quarters of those below age 60 (75 percent) learned this skill at school, compared with 62 percent of those age 60 and older. Conversely, almost a quarter (24 percent) of the older adults and 13 percent of the younger adults learned letter writing at home. About 10 percent of each group learned this skill at work.

Among 16- to 59-year-olds, literacy proficiencies do not vary significantly according to whether individuals learned to read newspapers and other prose materials in school or at home (table 4.2). Performance does vary significantly among persons age 60 and older, however. Older persons who acquired prose skills in school demonstrated higher literacy proficiencies, on average, than those who learned these skills at home.

Table 4.2
Average literacy proficiencies of adults who learned to read different materials in various places, by type of material and by age

Type of material/ literacy scale/ age group	n	WGT N (/1000)	Average proficiencies: School	Home	Work	Did not learn	Other
Newspapers, books, magazines							
Prose							
60 and older	3,692	39,315	244 (1.8)	235 (2.1)	225 (17.7)!	106 (11.1)!	---
16 to 59	21,218	150,865	283 (0.8)	284 (1.2)	243 (5.1)!	110 (5.9)!	---
Document							
60 and older	3,692	39,315	232 (1.7)	220 (2.1)	203 (2.4)!	119 (9.3)!	---
16 to 59	21,218	150,865	279 (0.8)	280 (1.2)	244 (4.9)!	122 (6.5)!	--
Graphs, maps							
Document							
60 and older	3,693	39,327	237 (1.7)	211 (3.3)	229 (4.8)	163 (4.5)	184 (7.8)!
16 to 59	21,210	150,785	286 (0.7)	260 (2.2)	268 (2.1)	168 (4.2)	215 (6.6)!
Quantitative							
60 and older	3,693	39,327	250 (2.3)	223 (4.3)	248 (6.3)	162 (4.9)	179 (11.2)!
16 to 59	21,210	150,785	288 (0.6)	264 (2.2)	276 (2.2)	160 (4.4)	222 (8.0)!
Forms							
Document							
60 and older	3,696	39,387	239 (1.8)	209 (2.8)	235 (2.4)	144 (6.0)	201 (18.7)!
16 to 59	21,209	150,820	281 (0.9)	275 (1.8)	285 (1.4)	149 (5.3)	246 (10.8)!
Letters							
Prose							
60 and older	3,694	39,369	245 (1.5)	219 (3.3)	264 (5.1)	135 (11.1)!	---
16 to 59	21,505	150,836	284 (0.6)	265 (1.8)	304 (1.9)	147 (6.5)!	220 (12.6)!

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

--- Sample size is too small to provide a reliable proficiency estimate.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Among adults under age 60, those who learned to read graphs and maps in school demonstrated higher average document and quantitative proficiencies than those who learned this skill elsewhere. Among those age 60 and older, however, there are no significant proficiency differences between those who learned this skill in school and those who learned it at work. The fact that older adults were less likely than younger adults to report learning graph or map reading in school, and were more likely not to learn these skills at all, may partly explain the relatively large gap in document proficiency between the older and younger populations. Even so, the literacy proficiencies of the older population are considerably lower than those of the younger population, regardless of the place of learning these particular skills. For adults in both age groups who had not learned to read graphs or maps, the average document and quantitative scores are about the same.

Within the under-60 population, there are no significant differences in performance according to where individuals learned to fill out forms. There is considerable variation within the older population, however. Adults age 60 and older who learned this skill at home demonstrated considerably lower document proficiencies, on average, than those_ who acquired this skill in school or at work.

As with learning to read graphs and maps, older adults were more likely than younger adults to report that they learned how to fill out forms at home, and to report that they had not learned this skill at all. This does not fully explain the weak document literacy skills of older persons, however. Even when the place of learning is held constant, younger persons still outperformed older persons. The biggest differences in performance between the two populations occur among those who learned to read forms at home. The gap mu-rows between older and younger adults who learned this skill in school. Again, the average document proficiencies of adults in both age groups who did not learn to fill out forms are similar.

Those who learned to write letters at work displayed stronger literacy skills, on average, than those who acquired this skill in school or at home. The younger age group has consistently higher average prose scores than the older group, regardless of where letter-writing skills were learned.

Beyond providing a place for reading, the local public library is often cited as a potential information source, point of public contact, and clearinghouse for older persons, offering access to information and social services.[1] Still, more than half (59 percent) the older adult population reported that they never use the public library, while only about one-fifth said they use it at least once a month (table 4.3). In contrast, 28 percent of adults under age 60 said they never use the library, while 39 percent are regular (at least monthly) users.

Adults' literacy skills are strongly associated with their library use: The more frequent the use, the higher the literacy proficiencies tend to be (table 4.4). Sixty-one percent of older adults who never use the library performed in Level 1 on the document literacy scale, and slightly more than half performed in this level on the prose and quantitative scales. Library users were far less likely (17 to 32 percent) to perform in that level on any of the literacy scales.

On average, the prose, document, and quantitative literacy scores of older adults who do not use the library are in the Level 1 range. Older adults who

Table 4.3
Percentages of adults, by frequency of library use and by age

Age	n	WGT N (/1000)	Row percentages: Daily	Weekly	Monthly	Once or twice a year	Never
60 and older	3,694	39,370	1 (0.2)	7 (0.5)	11 (0.7)	22 (1.0)	59 (0.9)
16 to 59	21,231	151,001	3 (0.2)	14 (0.3)	22 (0.5)	34 (0.5)	28 (0.5)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

[1] B.B. Moore and C.C. Young. (November 1985). "Library/Information Semites and the Nation's Elderly," *Journal of the American Society for Information Science*, 36 (6).

use the library once or twice a year tended to demonstrate stronger literacy skills than non users, and those who use the library monthly or weekly tended to display the highest proficiencies. Although weekly users constitute less than 10 percent of the older population, their prose and quantitative scores are quite high, falling in the range for Level 3.

Table 4.4
percentages of older adults in each literacy level and average literacy proficiencies, by frequency of library use

Literacy scale/ frequency of library use	n	WGT N (/1000)	Row percentages: Level 1	Level 2	Level 3	Level 4	Level 5	Average Proficiency
Prose								
Daily	39	306	---	---	---	---	---	---
Weekly	282	2,876	17 (4.0)	29 (4.3)	36 (4.0)	15 (3.5)	3 (1.5)	278 (3.9)
Monthly	450	4,313	17 (2.6)	34 (3.4)	34 (3.4)	12 (2.0)	2 (1.1)	274 (2.9)
Yearly	860	8,597	24 (2.2)	35 (2.6)	30 (2.8)	10 (1.4)	1 (0.5)	262 (2.9)
Never	2,063	23,279	52 (1.7)	32 (1.8)	14 (1.3)	2 (0.6)	0† (0.1)	216 (2.0)
Document								
Daily	39	306	---	---	---	---	---	---
Weekly	282	2,876	23 (3.5)	37 (3.7)	29 (3.9)	10 (3.1)	1 (1.3)	263 (3.9)
Monthly	450	4,313	24 (3.2)	38 (4.2)	29 (4.0)	8 (2.1)	1 (0.6)	258 (3.0)
Yearly	860	8,597	32 (2.6)	39 (3.4)	23 (2.1)	6 (1.2)	0† (0.3)	247 (2.7)
Never	2,063	23,279	61 (1.5)	29 (1.7)	9 (1.0)	1 (0.5)	0† (0.1)	204 (1.9)
Quantitative								
Daily	39	306	---	---	---	---	---	---
Weekly	282	2,876	20 (3.4)	28 (3.4)	29 (3.8)	18 (3.1)	5 (2.5)	278 (4.1)
Monthly	450	4,313	20 (2.7)	28 (3.4)	31 (3.4)	16 (2.4)	4 (1.7)	274 (4.7)
Yearly	860	8,597	25 (2.4)	29 (2.1)	30 (2.4)	12 (1.8)	3 (0.9)	265 (3.2)
Never	2,063	23,279	53 (1.7)	26 (1.4)	16 (1.7)	4 (1.0)	1 (0.2)	212 (2.7)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

† Percentages less than 0.5 are rounded to 0.

--- Sample size is too small to provide a reliable proficiency estimate.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Newspaper Reading

Survey respondents were asked how often they read newspapers in English. Regular newspaper reading is somewhat more prevalent among older persons than among younger persons (table 4.5). Four out of five (80 percent) of those age 60 and older reported reading a newspaper at least a few times a week, compared with 71 percent of adults under 60. Older adults (8 percent) were slightly more likely than younger adults (5 percent) to report never reading a newspaper, however.

On average, those who say they often read a newspaper demonstrate stronger literacy skills than those who do not (table 4.6). Within the older adult population, individuals who reported reading the newspaper at least a few times a week have average proficiencies of approximately 250 on the prose and quantitative scales and 236 on the document scale. For those who read the newspaper less than a few times a week, average literacy scores drop into the Level 1 range on all three literacy scales. It is particularly noteworthy that older adults who never read a newspaper have such low average proficiencies (160 on the prose scale, 146 on the document scale, and 127 on the quantitative scale) that they are likely to be able to succeed on only the most basic literacy tasks—and some may even have difficulty with these types of tasks.

Table 4.5
percentages of adults, by frequency of newspaper reading and by age

Age			Row percentages			
	n	WGT N (/1000)	Daily/ a few times a week	Once a week	Less than once a week	Never
60 and older	3,710	39,390	80 (0.8)	8 (0.5)	4 (0.4)	8 (0.5)
16 to 59	22,366	151,782	71 (0.6)	16 (0.4)	8 (0.2)	5 (0.2)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

The same pattern is evident among younger persons: adults reporting more frequent newspaper reading tended to display stronger literacy skills. While younger adults outperformed older adults regardless of the frequency of newspaper reading, the gap shrinks dramatically for adults who never read a newspaper. On the prose scale, the average proficiency of older adults who read a newspaper at least a few times a week is 43 points below that of younger adults who read one that often. In contrast, there is only a 19-point difference in average prose scores between older and younger adults who never read a newspaper.

Table 4.6

Average literacy proficiencies, by frequency of newspaper reading and by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: Daily/ a few times a week	Once a week	Less than once a week	Never
60 and older	3,710	39,390				
Prose			250 (1.5)	221 (5.2)	195 (7.3)!	160 (5.6)
Document			236 (1.5)	211 (4.6)	189 (6.3)!	146 (5.4)
Quantitative			251 (2.0)	218 (5.6)	201 (6.8)!	127 (6.6)
16 to 59	22,366	151,782				
Prose			293 (0.7)	273 (1.4)	267 (2.5)	179 (3.0)
Document			288 (0.7)	272 (1.3)	265 (2.6)	179 (3.1)
Quantitative			292 (0.6)	272 (1.4)	266 (2.5)	177 (3.0)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Magazine Reading

The magazine reading habits of the older and younger populations differ somewhat, as shown in table 4.7. About half those in each age group reported reading three or more magazines in English on a regular basis. However, older adults (31 percent) were slightly less likely than younger adults (37 percent) to report reading one or two magazines on a regular basis and were more likely to report that they do not read any magazines (23 percent of older adults, compared with 17 percent of younger adults).

Literacy skills are related to magazine reading (table 4.8). On all three scales, older adults who reported reading three or more magazines in English on a regular basis performed better in the assessment than those who reported reading only one or two. For example, the average prose score of older adults who read three or more magazines regularly is 262, compared with 235 for those who read one or two. In turn, the prose literacy scores of older adults who read one or two magazines (235) tend to be higher than those of individuals who read no magazines (193). Thus, older persons who reported at least some magazine reading performed, on average, in the Level 2 range, while those who do not read magazines have proficiency scores within the Level 1 range. The same patterns appear for younger persons, although overall scores tend to be higher for this group than for older persons.

Table 4.7
Percentages of adults, by number of magazines read and by age

Age	n	WGT N (/1000)	Row percentages: None	One or two	Three or more
60 and older	3,705	39,347	23 (0.9)	31 (0.9)	46 (1.0)
16 to 59	22,353	151,714	17 (0.4)	37 (0.5)	47 (0.5)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 4.8
Average literacy proficiencies, by number of magazines read and by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: None	One or two	Three or more
60 and older	3,705	39,347			
Prose			193 (3.7)	235 (2.2)	262 (2.0)
Document			182 (3.5)	222 (2.1)	247 (1.8)
Quantitative			185 (4.5)	236 (2.5)	261 (2.3)
16 to 59	22,353	151,714			
Prose			236 (1.8)	280 (1.0)	299 (0.7)
Document			235 (1.9)	277 (1.0)	294 (0.7)
Quantitative			238 (1.8)	279 (1.0)	297 (0.9)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Sources of Information about Current Events

Survey participants were asked to indicate the extent to which they rely on various sources of information about current events, public affairs, and government. Reliance on these different sources appears to vary somewhat by age, as shown in table 4.9. Television is the most frequently used medium, with three out of four older persons (74 percent) and two out of three younger persons (65 percent) getting a lot of their information from this source. Newspapers are second for both the older adult and under-60 populations (53 and 41 percent, respectively), followed by radio (28 and 38 percent, respectively). About the same percentages of older adults get a lot of information from magazines and family members (20 and 22 percent, respectively), whereas younger adults are more likely to get a lot of information from family members than from magazines (23 and 17 percent, respectively).

Older adults were more likely than younger adults to report getting no information from each of the sources, except television. For example, about 20 percent of older adults reported getting no information from magazines or radio, compared with 13 and 6 percent, respectively, of younger adults.

Table 4.9

Percentages of adults, by reliance on various sources of information and by age

Source of information/ age	n	WGT N (/1000)	Row percentages: A lot	Some	Little	None
Newspapers						
60 and older	3,693	39,383	53 (1.0)	27 (0.9)	11 (0.5)	9 (0.6)
16 to 59	21,231	151,022	41 (0.6)	36 (0.5)	17 (0.4)	6 (0.2)
Magazines						
60 and older	3,684	39,266	22 (0.9)	35 (0.9)	21 (0.8)	22 (0.9)
16 to 59	21,220	150,914	17 (0.4)	41 (0.5)	29 (0.5)	13 (0.3)
Radio						
60 and older	3,692	39,323	28 (1.0)	28 (0.8)	23 (0.8)	20 (1.0)
16 to 59	21,217	150,940	38 (0.5)	35 (0.5)	21 (0.4)	6 (0.2)
Television						
60 and older	3,695	39,374	74 (1.1)	19 (0.8)	5 (0.4)	2 (0.3)
16 to 59	21,224	150,975	65 (0.6)	25 (0.5)	9 (0.3)	2 (0.2)
Family members						
60 and older	3,686	39,288	20 (0.8)	40 (1.0)	28 (0.8)	13 (0.7)
16 to 59	21,215	150,937	23 (0.4)	45 (0.5)	26 (0.4)	5 (0.2)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Literacy proficiencies vary significantly by information source (table 4.10 and tables B4.1 and B4.2 in Appendix B). The average literacy scores of older persons who rely heavily on television for information are significantly lower than the scores of those who rely heavily on newspapers, although the proficiencies of both groups tend to fall in the Level 2 range. For example, the average prose score of older adults who get a lot of information from television is 236, compared with 253 for those who get a lot of information from newspapers. The literacy skills of older individuals who rely on magazines a great deal are similar to those of their peers who depend on newspapers to a similar extent (about 250 on the prose scale, for example). The average scores of older adults who rely heavily on radio for their information are similar to those of their peers who rely heavily on television (for example, about 235 on the prose scale). Older adults who rely on family members a lot have lower

Table 4.10
Average prose literacy proficiencies of adults, by reliance on various sources of information and by age

Source of information/ age	n	WGT N (/1000)	Average proficiencies: A lot	Some	Little	None
Newspapers						
60 and older	3,693	39,383	253 (1.7)	240 (2.4)	208 (4.2)	175 (4.6)
16 to 59	21,231	151,022	294 (0.9)	283 (1.0)	269 (1.3)	221 (3.0)
Magazines						
60 and older	3,684	39,266	252 (3.0)	255 (2.1)	239 (3.1)	195 (3.4)
16 to 59	21,220	150,914	293 (1.5)	292 (0.8)	282 (1.2)	234 (1.7)
Radio						
60 and older	3,692	39,323	231 (2.5)	247 (2.7)	247 (2.8)	223 (3.2)
16 to 59	21,217	150,940	278 (0.9)	289 (1.0)	283 (1.3)	259 (3.1)
Television						
60 and older	3,695	39,374	236 (1.7)	251 (3.1)	230 (8.0)!	185 (17.7)!
16 to 59	21,224	150,975	276 (0.7)	295 (1.2)	287 (2.3)	292 (5.9)
Family members						
60 and older	3,686	39,288	226 (3.3)	246 (2.4)	245 (2.5)	213 (4.4)
16 to 59	21,215	150,937	273 (1.4)	288 (0.8)	286 (1.4)	244 (2.7)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

literacy proficiencies, on average, than those who rely on other sources to this extent.

Literacy proficiencies also vary according to the amount of reliance on each particular source. For older adults, there is a step-by-step decrease in average scores on the three literacy scales as the amount of reliance on newspapers also decreases. On the prose scale, for example, adults age 60 and older who get a lot of information from newspapers have an average score of 254, compared with 242 for those who get some information, 200 for those who get a little, and 154 for those who get none.

For magazines there is also a decrease in proficiency as the amount of information decreases, except that there is no significant difference in performance between those who get some and those who get a lot of information from this source.

For non-print sources, the patterns are different. The literacy proficiencies of older adults who get some or a little of their information from radio or family members are higher than the proficiencies of those who get a lot of information from either of these sources: but then proficiencies decline again for older adults who get none of their information from these sources. In fact, on each literacy scale, older adults who get a lot of their information from radio and those who get none performed comparably. Older adults who get some of their information from television tended to outscore those who get a lot of information from this source.

As seen with other activities, the proficiencies of the younger population are consistently higher than those of the older group, regardless of the information source and the extent to which that source is relied upon.

Television Viewing

Overall, older adults reported more television viewing than adults under age 60 (table 4.11). Forty-four percent of older adults said that they generally watch four or more hours of television a day, compared with 29 percent of the under-60 age group. While 13 percent of adults age 60 and older reported watching no more than an hour of television a day, nearly one-quarter (23 percent) of those under age 60 watch this amount.

Table 4.11
Percentages of adults, by average amount of daily television viewing and by age

Age	n	WGT N (/1000)	Row percentages: 0 to 1 hour	2 to 3 hours	4 or more hours
60 and older	3,698	39,419	13 (0.7)	43 (1.0)	44 (0.9)
16 to 59	21,236	151,052	23 (0.5)	48 (0.5)	29 (0.6)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Higher literacy proficiencies are related to less television viewing among older persons (table 4.12). Among those who watch four or more hours a cloy, average scores on the prose and quantitative scales are about 225, the dividing line between Levels 1 and 2. On the document scale, the average score of older adults who watch this much television is 216. Among those who watch less than four hours a day, average proficiencies are near the mid-range of Level 2 (except on the document scale), and thus are significantly higher than those of adults who watch more television. Although the literacy proficiencies of older adults who watch two to three hours of television a day appear to be slightly higher than those of their peers who watch less than that, these differences are not statistically significant.

The greatest difference between the literacy skills of older and younger persons is found among those who spend relatively little time watching television. For example, the average prose score of older adults who watch one hour or less of television a day (240) is 60 points below that of younger adults (300) who watch this amount. On the other hand, the average prose score of older adults who watch four or more hours a day (228) is 34 points below that of the younger age group (262).

Table 4.12
Average literacy proficiencies of adults, by average amount of daily television viewing and by age

Age/ literacy scale	n	WGT N (/1000)	Average proficiencies: 0 to 1 hour	2 to 3 hours	4 or more hours
60 and older	3,698	39,419			
Prose			240 (4.8)	247 (2.1)	228 (2.2)
Document			226 (4.3)	232 (2.3)	216 (2.1)
Quantitative			238 (5.7)	244 (2.4)	226 (2.6)
16 to 59	21,236	151,052.			
Prose			300 (1.5)	285 (0.8)	262 (0.9)
Document			293 (1.7)	282 (0.9)	259 (0.9)
Quantitative			299 (1.6)	286 (0.8)	257 (0.9)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population' values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Personal Literacy Activities

Older adults were asked how often they engage in various literacy activities for their personal use, such as reading letters or memos; reports, articles, magazines, or journals; manuals or reference books, including catalogs; directions or instructions; diagrams; and bills, invoices, spreadsheets, or budget tables. The most common personal literacy activity is using arithmetic, a task performed often by 65 percent of the older population (table 4.13). On the other hand, older adults were far less likely to report that they often read diagrams (4 percent) and write reports (6 percent). A greater percentage of younger than older adults reported doing all of the activities often, with the exception of reading directions.

Within the older population there is a positive relationship, regardless of the type of literacy activity, between the frequency of engaging in the activity and demonstrated proficiency (table 4.14 and tables B4.3 and B4.4 in Appendix B). Typically, either often or occasional performance of a particular activity is related to average performance in Level 2, while rarely performing a task is characterized by average proficiency in Level 1.

The average prose proficiencies of older adults who often read letters, reports, and manuals are higher than those of individuals who only occasionally engage in these activities. For all other personal literacy activities, the proficiencies of older adults who engage in them often or occasionally are higher than those of adults who engage in them rarely.

Comparing older and younger persons yields results consistent with those discussed elsewhere in this report. For each literacy activity and frequency category, younger adults performed consistently better in the assessment (on average) than older adults. The proficiency gaps between the two age groups are remarkably consistent, regardless of the literacy scale, activity, or frequency.

Table 4.13
Percentages of adults, by frequency of personal literacy activities and by age

Type of use and material/ age group	n	WGT N (/1000)	Row percentages: Often	Occasionally	Never
Read:					
Letters, memos					
60 and older	3,706	39,366	41 (0.9)	15 (0.7)	44 (1.1)
16 to 59	22,353	151,714	47 (0.6)	14 (0.4)	39 (0.6)
Reports					
60 and older	3,708	39,386	40 (1.1)	16 (0.7)	44 (1.1)
16 to 59	22,343	151,656	45 (0.6)	20 (0.3)	35 (0.5)
Manuals					
60 and older	3,704	39,333	21 (1.1)	15 (0.8)	64 (1.1)
16 to 59	22,327	151,533	31 (0.5)	20 (0.5)	48 (0.6)
Directions					
60 and older	3,705	39,349	41 (1.2)	16 (0.8)	43 (1.3)
16 to 59	22,312	151,416	40 (0.5)	19 (0.5)	41 (0.5)
Diagrams					
60 and older	3,688	39,139	4 (0.4)	5 (0.4)	91 (0.5)
16 to 59	22,295	151,275	12 (0.3)	8 (0.2)	80 (0.3)
Bills, invoices					
60 and older	3,706	39,350	29 (1.0)	19 (0.8)	53 (1.0)
16 to 59	22,312	151,299	44 (0.5)	22 (0.3)	34 (0.4)
write					
Letters					
60 and older	3,693	39,361	28 (0.9)	15 (0.8)	57 (1.2)
16 to 59	21,214	150,896	36 (0.5)	18 (0.3)	46 (0.5)
Reports					
60 and older	3,684	39,290	6 (0.5)	6 (0.5)	88 (0.8)
16 to 59	21,194	150,773	13 (0.4)	11 (0.3)	76 (0.5)
Forms					
60 and older	3,690	39,326	19 (0.9)	17 (0.9)	65 (1.0)
16 to 59	21,208	150,839	31 (0.4)	27 (0.4)	43 (0.4)
Use arithmetic					
60 and older	3,674	39,148	65 (1.2)	10 (0.9)	25 (1.0)
16 to 59	21,209	150,918	82 (0.4)	8 (0.3)	10 (0.3)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 4.14
Average literacy proficiencies of adults, by frequency of personal use of reading materials and by age

Literacy scale/ type of material/ age group	n	WGT N (/1000)	Average proficiencies: Often	Occasionally	Never
Prose					
Letters, memos					
60 and older	3,706	39,366	254 (1.9)	240 (3.0)	221 (2.5)
16 to 59	22,353	151,714	294 (0.8)	284 (1.2)	266 (1.1)
Reports					
60 and older	3,708	39,386	262 (2.1)	245 (3.4)	213 (2.4)
16 to 59	22,343	151,656	301 (0.8)	286 (1.3)	255 (1.2)
Manuals					
60 and older	3,704	39,333	266 (3.2)	250 (3.9)	226 (1.9)
16 to 59	22,327	151,533	296 (0.9)	292 (1.2)	268 (0.9)
Directions					
60 and older	3,705	39,349	244 (1.9)	250 (3.3)	227 (2.6)
16 to 59	22,312	151,416	291 (1.0)	292 (1.3)	268 (1.0)
Document					
Manuals					
60 and older	3,704	39,333	249 (3.2)	239 (2.8)	213 (1.9)
16 to 59	22,327	151,533	292 (0.9)	289 (1.2)	264 (1.0)
Directions					
60 and older	3,705	39,349	231 (2.0)	235 (2.6)	214 (2.7)
16 to 59	22,312	151,416	287 (0.9)	286 (1.2)	265 (1.0)
Diagrams					
60 and older	3,688	39,139	258 (6.2)!	250 (5.9)!	222 (1.6)
16 to 59	22,295	151,275	293 (1.7)	295 (1.8)	274 (0.7)
Bills, invoices					
60 and older	3,706	39,350	245 (2.2)	239 (2.9)	208 (2.4)
16 to 59	22,312	151,299	291 (0.8)	285 (1.2)	258 (1.2)
Quantitative					
Diagrams					
60 and older	3,688	39,139	272 (6.4)!	272 (7.1)!	232 (2.1)
16 to 59	22,295	151,275	297 (2.0)	299 (2.0)	276 (0.7)
Bills, invoices					
60 and older	3,706	39,350	259 (3.2)	254 (4.2)	217 (3.2)
16 to 59	22,312	151,299	294 (0.8)	288 (1.2)	258 (1.1)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Work-related Literacy Activities

Older adults who reported that they had held a paying job within the past three years were asked how often they engaged in certain literacy-related activities in their current or most recent job. These activities include reading letters or memos, reports or articles, manuals or reference books, directions, diagrams or schematics, and bills or invoices; writing letters, memos, or reports; filling in forms; and using arithmetic.

Employed persons age 60 and older reported having performed a host of literacy tasks on the job, although with not quite the same frequency as younger persons (table 4.15). Younger workers are slightly more likely to perform these tasks often, with the exception of reading reports. The most commonly performed tasks by both populations are using arithmetic (74 percent of the older and 82 percent of the younger population) and reading job-related letters and memos (60 and 68 percent, respectively).

Because the sample of older workers is small, some of the proficiency data should be interpreted with caution (table 4.16 and tables B4.5 and B4.6 in Appendix B). Nevertheless, it is possible to make some comparisons. Older adults who often engage in work-related literacy activities have higher average proficiencies than those who rarely engage in these activities (except for reading directions). The prose proficiencies of older adults who reported often reading letters, reports, and manuals are, on average, in the Level 3 range, and the quantitative proficiencies of older adults who often read diagrams and bills also are in this range. Even the scores of older adults who rarely read any of these materials on the job are, on average, in Level 2.

As reported in Chapter 3, older persons who were employed tended to have higher average literacy scores than those who were not. The results shown here are consistent with that finding. Although younger persons again demonstrated higher average literacy proficiencies than their older counterparts, the differences in performance between older and younger persons are smaller among those who engaged in various work-related literacy activities than they are in the population as a whole.

Table 4.15
Percentages of adults, by frequency of work-related literacy activities and by age

Type of use and material/ age group	n	WGT N (/1 000)	Row percentages: Often	Occasionally	Never
Read:					
Letters, memos					
60 and older	1,390	12,996	60 (1.7)	9 (0.9)	32 (1.8)
16 to 59	18,514	133,161	68 (0.5)	8 (0.3)	24 (0.5)
Reports					
60 and older	1,387	12,967	46 (1.8)	11 (1.1)	43 (1.9)
16 to 59	18,511	133,114	48 (0.5)	12 (0.3)	40 (0.5)
Manuals					
60 and older	1,390	12,996	41 (1.9)	11 (1.2)	49 (1.8)
16 to 59	18,508	133,161	49 (0.5)	12 (0.4)	40 (0.6)
Directions					
60 and older	1,389	12,990	29 (1.7)	8 (0.9)	62 (1.5)
16 to 59	18,491	133,003	33 (0.4)	9 (0.3)	58 (0.5)
Diagrams					
60 and older	1,388	12,972	23 (1.4)	6 (0.8)	71 (1.4)
16 to 59	18,479	132,882	30 (0.4)	10 (0.3)	60 (0.5)
Bills, invoices					
60 and older	1,389	12,992	36 (1.5)	10 (1.0)	54 (1.5)
16 to 59	18,501	133,082	41 (0.6)	10 (0.4)	49 (0.6)
Write					
Letters					
60 and older	1,389	12,991	49 (1.9)	9 (1.2)	42 (1.7)
16 to 59	18,486	132,993	54 (0.5)	8 (0.3)	38 (0.5)
Reports					
60 and older	1,389	12,991	49 (1.9)	9 (1.2)	42 (1.7)
16 to 59	18,486	132,993	54 (0.5)	8 (0.3)	38 (0.5)
Forms					
60 and older	1,389	12,991	38 (2.0)	9 (0.8)	53 (1.9)
16 to 59	18,482	132,972	45 (0.6)	10 (0.3)	45 (0.6)
Use arithmetic					
60 and older	1,390	12,952	74 (1.2)	5 (0.9)	21 (1.2)
16 to 59	18,508	133,210	82 (0.4)	4 (0.2)	13 (0.4)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table 4.16
Average literacy proficiencies of adults, by frequency of various work-related literacy activities and by age

Literacy scale/ type of material/ age group	n	WGT N (/1000)	Average proficiencies: Often	Occasionally	Never
Prose					
Letters, memos					
60 and older	1,390	12,996	276 (2.7)	264 (5.8)!	231 (4.3)
16 to 59	18,514	133,161	298 (0.7)	283 (2.1)	255 (1.3)
Reports					
60 and older	1,387	12,967	282 (3.2)	257 (8.3)!	240 (3.9)
16 to 59	18,511	133,114	303 (0.9)	294 (1.9)	264 (1.1)
Manuals					
60 and older	1,390	12,996	282 (3.8)	258 (7.2)!	244 (3.3)
16 to 59	18,508	133,161	301 (0.9)	293 (1.7)	267 (1.1)
Directions					
60 and older	1,389	12,990	263 (4.1)	263 (8.5)!	260 (3.0)
16 to 59	18,491	133,003	291 (1.1)	294 (2.5)	282 (0.9)
Document					
Manuals					
60 and older	1,390	12,996	264 (3.1)	252 (6.4)!	232 (3.6)
16 to 59	18,508	133,161	297 (0.9)	290 (1.7)	263 (1.2)
Directions					
60 and older	1,389	12,990	250 (3.8)	256 (7.3)!	244 (3.1)
16 to 59	18,491	133,003	288 (1.1)	291 (1.9)	278 (0.8)
Diagrams					
60 and older	1,388	12,972	269 (4.4)	256 (10.7)!	240 (2.2)
16 to 59	18,479	132,882	297 (1.0)	300 (2.0)	273 (0.9)
Bills, invoices					
60 and older	1,389	12,992	259 (3.0)	246 (6.9)!	239 (3.0)
16 to 59	18,501	133,082	295 (0.8)	287 (1.9)	272 (1.2)
Quantitative					
Diagrams					
60 and older	1,388	12,972	288 (4.8)	283 (11.5)!	258 (2.7)
16 to 59	18,479	132,882	302 (1.2)	306 (2.0)	275 (0.8)
Bills, invoices					
60 and older	1,389	12,992	282 (3.7)	273 (8.1)!	255 (3.1)
16 to 59	18,501	133,082	300 (0.9)	292 (1.8)	273 (1.0)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. Numbers in parentheses are standard errors. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Literacy skills vary significantly within and between age cohorts according to the manner in which various types of literacy skills were acquired. In general, learning a particular literacy skill at school or at work is associated with higher literacy proficiencies, compared with learning it at home or in the community. This pattern holds regardless of the age group, with younger adults consistently outperforming their older counterparts. There are some differences across the age groups in the places where particular skills were learned, but most adults in each age group learned their literacy skills at school.

Fifty-nine percent of older adults reported never using a library, compared with 28 percent of adults under 60. Adults age 60 and older who said they use the library demonstrate higher average literacy proficiencies than those who do not.

Older adults who read a newspaper in English at least a few times a week or who read some magazines on a regular basis tend to have higher literacy scores than those who do not engage in these reading activities.

Adults who watched less than four hours of television a day outperformed those who watched more. Frequent television viewing was more prevalent among older adults than among adults under 60.

Older adults who engaged in various literacy activities often, either on the job or for personal use, performed better in the assessment than those who engaged in these activities infrequently.

Across all of the literacy activities reported on in this chapter, younger adults who often engaged in each activity demonstrated higher average literacy proficiencies than their counterparts in the older adult population. There area few activities for which the gap in performance between the two age groups narrows, but it never disappears. The differences in average literacy scores between older and younger adults are somewhat smaller among those who reported watching four or more hours of television a day, never reading a newspaper, and engaging in various job-related literacy practices.

APPENDIX A

Interpreting the Literacy Scales"

Building on the two earlier literacy surveys conducted by Educational Testing Service (ETS), the performance results from the National Adult Literacy Survey are reported on three literacy scales — prose, document, and quantitative — rather than on a single conglomerate scale. Each of the three literacy scales ranges from O to 500.

The purpose of this section of the report is to give meaning to the literacy scales — or, more specifically, to interpret the numerical scores that are used to represent adults' proficiencies on these scales. Toward this end, the section begins with a brief summary of the task development process and of the way in which the literacy levels are defined. A detailed description of the prose, document, and quantitative scales is then provided. The five levels on each scale are defined, and the skills and strategies needed to successfully perform the tasks in each level are discussed. Sample tasks are presented to illustrate the types of materials and task demands that characterize the levels on each scale. The section ends with a brief summary of the probabilities of successful performance on tasks within each level for individuals who demonstrated different proficiencies.

Building the Literacy Tasks

The literacy scales make it possible not only to summarize the literacy proficiencies of the total population and of various subpopulations, but also to determine the relative difficulty of the literacy tasks administered in the survey. That is, just as an individual receives a score according to his or her performance on the assessment tasks, each task receives a value according to its difficulty as determined by the performance of the adults who participated in the survey. Previous research conducted at ETS has shown that the difficulty of a literacy task, and therefore its placement on a particular literacy scale, is determined by

*This chapter originally appeared in the first report on the National Adult Literacy Survey, I. S. Kirsch, A. Jungeblut, L. Jenkins, and A. Kolstad. (September 1993). *Adult Literacy In America: A First Look at the Results of the National Adult Literacy Survey.* Washington, DC: US Department of Education.

three factors: the structure or linguistic format of the material, the content and/or the context from which it is selected, and the nature of the task, or what the individual is asked to do with the material.

Materials. The materials selected for inclusion in NALS reflect a variety of linguistic formats that adults encounter in their daily activities. Most of the prose materials used in the survey are expository — that is, they describe, define, or inform — since most of the prose that adults read is expository in nature; however, narratives and poetry are included, as well. The prose materials include an array of linguistic structures, ranging from texts that are highly organized both topically and visually to those that are loosely organized. They also include texts of varying lengths, from multiple-page magazine selections to short newspaper articles. All prose materials included in the survey were reproduced in their original format.

The document materials represent a wide variety of structures, which are characterized as tables, charts and graphs, forms, and maps, among other categories. Tables include matrix documents in which information is arrayed in rows and columns — for example, bus or airplane schedules, lists, or tables of numbers. Documents categorized as charts and graphs include pie charts, bar graphs, and line graphs. Forms are documents that require information to be filled in, while other structures include such materials as advertisements and coupons.

The quantitative tasks require the reader to perform arithmetic operations using numbers that are embedded in print. Since there are no materials that are unique to quantitative tasks, these tasks were based on prose materials and documents. Most quantitative tasks were, in fact, based on document structures.

Content and/or Contexts. Adults do not read printed or written materials in a vacuum. Rather, they read within a particular context or for a particular purpose. Accordingly, the NALS materials represent a variety of contexts and contents. Six such areas were identified: home and family; health and safety; community and citizenship; consumer economics; work; and leisure and recreation.

In selecting materials to represent these areas, efforts were made to include as broad a range as possible, as well as to select universally relevant contexts and contents. This was to ensure that the materials would not be so specialized as to be familiar only to certain groups. In this way, disadvantages for individuals with limited background knowledge were minimized.

Types of Tasks. After the materials were selected, tasks were developed to accompany the materials. These tasks were designed to simulate the ways in which people use various types of materials and to require different strategies for successful task completion. For both the prose and document scales, the

tasks can be organized into three major categories: *locating, integrating,* and *generating* information. In the locating tasks, readers are asked to match information that is given in a question or directive with either literal or synonymous information in the text or document. Integrating tasks require the reader to incorporate two or more pieces of information located in different parts of the text or document. Generating tasks require readers not only to process information located in different parts of the material, but also to go beyond that information by drawing on their knowledge about a subject or by making broad text-based inferences.

Quantitative tasks require readers to perform arithmetic operations — addition, subtraction, multiplication, or division — either singly or in combination. In some tasks, the type of operation that must be performed is obvious from the wording of the question, while in other tasks the readers must infer which operation is to be performed. Similarly, the numbers that are required to perform the operation can, in some cases, be easily identified, while in others, the numbers that are needed are embedded in text. Moreover, some quantitative tasks require the reader to explain how the problem would be solved rather than perform the calculation, and on some tasks the use of a simple four-function calculator is required.

Defining the Literacy Levels

The relative difficulty of the assessment tasks reflects the interactions among the various task characteristics described here. As shown in Figure 1 in the Introduction to this report, the score point assigned to each task is the point at which the individuals with that proficiency score have a high probability of responding correctly. In this survey, an 80 percent probability of correct response was the criterion used. While some tasks were at the very low end of the scale and some at the very high end, most had difficulty values in the 200 to 400 range.

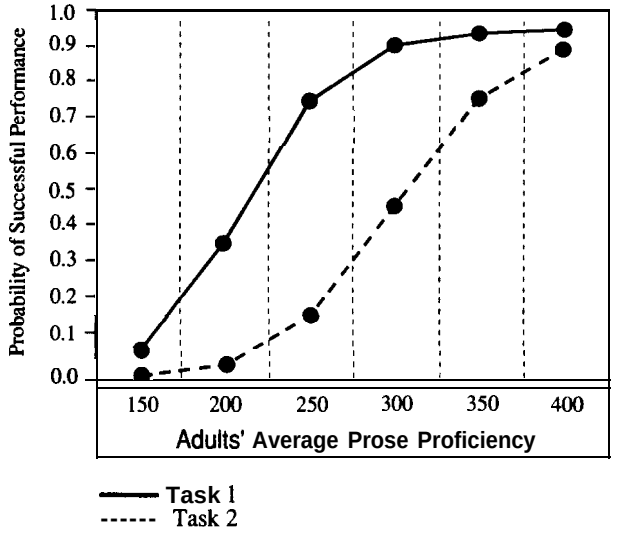
By assigning scale values to both the individuals and tasks, it is possible to see how well adults with varying proficiencies performed on tasks of varying difficulty. While individuals with low proficiency tend to perform well on tasks with difficulty values equivalent to or below their level of proficiency, they are less likely to succeed on tasks with higher difficulty values. This does not mean that individuals with low proficiency can never succeed on more difficult literacy tasks — that is, on tasks whose difficulty values are higher than their proficiencies. They may do so some of the time. Rather, it means that their probability of success is not as high. In other words, the more difficult the task relative to their proficiency, the lower their likelihood of responding correctly.

The response probabilities for two tasks on the prose scale are displayed in Figure 3.1. The difficulty of the first task is measured at the 250 point on the scale, and the second task is at the 350 point. This means that an individual would have to score at the 250 point on the prose scale to have an 80 percent chance (that is, a .8 probability) of responding correctly to Task 1. Adults scoring at the 200 point on the prose scale have only a 40 percent chance of responding correctly to this task, whereas those scoring at the 300 point and above would be expected to rarely miss this task and others like it.

In contrast, an individual would need to score at the 350 point to have an 80 percent chance of responding correctly to Task 2. While individuals performing at the 250 point would have an 80 percent chance of success on the first task, their probability of answering the more difficult second task correctly is only 20 percent. An individual scoring at the 300 point is likely to succeed on this more difficult task only half the time.

NALS **Figure A.1**

Probabilities of Successful Performance on Two Prose Tasks by Individuals at Selected Points on the Prose Scale



Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

An analogy may help clarify the information presented for the two prose tasks. The relationship between task difficulty and individual proficiency is much like the high jump event in track and field, in which an athlete tries to jump over a bar that is placed at increasing heights. Each high jumper has a height at which he or she is proficient. That is, he or she is able to clear the bar at that height with a high probability of success, and can clear the bar at lower levels almost every

time. When the bar is higher than their level of proficiency, however, they can be expected to have a much lower chance of clearing it successfully.

Once the literacy tasks are placed on their respective scales, using the criterion described here, it is possible to see how well the interactions among the task characteristics explain the placement of various tasks along the scales. * In investigating the progression of task characteristics across the scales, certain questions are of interest. Do tasks with similar difficulty values (that is, with difficulty values near one another on a scale) have certain shared characteristics? Do these characteristics differ in systematic ways from tasks in either higher or lower levels of difficulty? Analyses of the interactions between the materials read and the tasks based on these materials reveal that an ordered set of information-processing skills appears to be called into play to perform the range of tasks along each scale.

To capture this ordering, each scale was divided into five levels that reflect the progression of information-processing skills and strategies: Level 1 (0 to 225), Level 2 (226 to 275), Level 3 (276 to 325), Level 4 (326 to 375), and Level 5 (376 to 500). These levels were determined not as a result of any statistical property of the scales, but rather as a result of shifts in the skills and strategies required to succeed on various tasks along the scales, from simple to complex.

The remaining pages of this section describe each scale in terms of the nature of the task demands at each of the five levels. After a brief introduction to each scale, sample tasks in each level are presented and the factors contributing to their difficulty are discussed. The aim of these discussions is to give meaning to the scales and to facilitate interpretation of the results provided in the first and second sections of this report.

interpreting the Literacy Levels

Prose Literacy

The ability to understand and use information contained in various kinds of textual material is an important aspect of literacy. Most of the prose materials administered in this assessment were expository — that is, they inform, define, or describe — since these constitute much of the prose that adults read. Some narrative texts and poems were included, as well. The prose materials were drawn from newspapers, magazines, books, brochures, and pamphlets and reprinted in their entirety, using the typography and layout of the original source. AS a result, the materials vary widely in length, density of information, and the

[1] I.S. Kirsch and P.B. Mosenthal. (1990). "Exploring Document Literacy Variable Underlying the Performance of Young Adults". Reading *Research Quarterly*, 25. pp. 5-30.

use of structured or organizational aids such as section or paragraph headings, italic or bold face type, and bullets.

Each prose selection was accompanied by one or more questions or directives which asked the reader to perform specific tasks. These tasks represent three major aspects of information-processing: locating, integrating, and generating. Locating tasks require the reader to find information in the text based on conditions or features specified in the question or directive. The match may be literal or synonymous, or the reader may need to make a text-based inference in order to perform the task successfully Integrating tasks ask the reader to compare or contrast two or more pieces of information from the text. In some cases the information can be found in a single paragraph, while in others it appears in different paragraphs or sections. In the generating tasks, readers must produce a written response by making text-based inferences or drawing on their own background knowledge.

In all, the prose literacy scale includes 41 tasks with difficulty values ranging from 149 to 468. It is important to remember that the locating, generating, and integrating tasks extend over a range of difficulty as a result of interactions with other variables including:

- the number of categories or features of information that the reader must process
- the number of categories or features of information in the text that can distract the reader, or that may seem plausible but are incorrect
- the degree to which information given in the question is obviously related to the information contained in the text
- the length and density of the text

The five levels of prose literacy are defined, and sample tasks provided, in the following pages.

Prose Level 1 **Scale** range: O to 225

Most of the tasks in this level require the reader to read relatively short text to locate a single piece of information which is identical to or synonymous with the information given in the question or directive. If plausible but incorrect information is present in the text, it tends not to be located near the correct information.

Average difficulty value of tasks in this level: 198
Percentage of adults performing in this level: 21%

Tasks in this level require the reader to locate and match a single piece of information in the text. Typically the match between the question or directive and the text is literal, although sometimes synonymous matches may be necessary. The text is usually brief or has organizational aids such as paragraph headings or italics that suggest where in the text the reader should search for the specified information. The word or phrase to be matched appears only once in the text.

One task in Level 1 with a difficulty value of 208 asks respondents to read a newspaper article about a marathon swimmer and to underline the sentence that tells what she ate during a swim. Only one reference to food is contained in the passage, and it does not use the word "ate." Rather, the article says the swimmer "kept up her strength with banana and honey sandwiches, hot chocolate, lots of water and granola bars." The reader must match the word "ate" in the directive with the only reference to foods in the article.

Underline the sentence that tells what Ms. Chanin ate during the swim,

Swimmer completes Manhattan marathon

The Associated Press

NEW YORK—University of Maryland senior Stacy Chanin on Wednesday became the first person to swim three 28-mile laps around Manhattan.

Chanin, 23, of Virginia, climbed out of the East River at 96th Street at 9:30 p.m. She began the swim at noon on Tuesday.

A spokesman for the swimmer, Roy Brunett, said Chanin had kept up her strength with "banana and honey" sandwiches, hot chocolate, lots of water and granola bars."

Chanin has twice circled Manhattan before and trained for the new feat by swimming about 28.4 miles a week. The Yonkers native has competed as a swimmer since she was 15 and hoped to persuade Olympic authorities to add a long-distance swimming event.

The Leukemia Society of America solicited pledges for each mile she swam.

In July 1983, Julie Ridge became the first person to swim around Manhattan twice. With her three laps, Chanin came up just short of Diana Nyad's distance record, set on a Florida-to-Cuba swim.

Reduced from original copy.

Prose Level 2 Scale range: 226 to 275

Some tasks in this level require reader-s to locate a single piece of information in the text; however, several distractors or plausible but incorrect pieces of information may be present, or low-level inferences may be required Other tasks require the reader to integrate two or more pieces of information or to compare and contrast easily identifiable information based on a criterion provided in the question or *directive.*

Average difficulty value of tasks in this level: 259
Percentage of adults performing in this level: 27%

Like the tasks in Level 1, most of the tasks in this level ask the reader to locate information. However, these tasks place more varied demands on the reader. For example, they frequently require readers to match more than a single piece of information in the text and to discount information that only partially satisfies the question. If plausible but incomplete information is included in the text, such distracters do not appear near the sentence or paragraph that contains the correct answer. For example, a task based on the sports article reproduced earlier asks the reader to identify the age at which the marathon swimmer began to swim competitively. The article first provides the swimmer's current age of 23, which is a plausible but incorrect answer. The correct information, age 15, is found toward the end of the article.

In addition to directing the reader to locate more than a single piece of information in the text, low-level inferences based on the text may be required to respond correctly. Other tasks in Level 2 (226 to 275) require the reader to identify information that matches a given criterion. For example, in one task with a difficulty value of 275, readers were asked to identify specifically what was wrong with an appliance by choosing the most appropriate of four statements describing its malfunction.

A manufacturing company provides its customers with the following instructions for returning appliances for service:

> When returning appliance for servicing, include a note telling as clearly and as specifically as possible what is wrong with the appliance.

A repair person for the company receives four appliances with the following notes attached. Circle the letter next to the note which best follows the instructions supplied by the company.

A
> The clock does not run correctly on this clock radio. I tried fixing it, but I couldn't.

C
> The alarm on my clock radio doesn't go off at the time I set. It rings 15-30 minutes later.

B
> My clock radio is not working. It stopped working right after I used it for five days.

D
> This radio is broken. Please repair and return by United Parcel Service to the address on my slip.

Readers in this level may also be asked to infer a recurring theme. One task with a difficulty value of 262 asks respondents to read a poem that uses several metaphors to represent a single, familiar concept and to identify its theme. The repetitiveness and familiarity of the allusions appear to make this "generating" task relatively easy.

Scale range: 276 to 325

Treks in this level tend to require readers to make literal or synonymous matches between the text and information given in the task, or to make matches that require low-level inferences. Other tasks ask readers to integrate information from dense or lengthy text that contains no organizational aids such as headings. Readers may also be asked to generate a response based on information that can be easily identified in the text. Distracting information is present, but is not located near the correct information.

Average difficulty value of tasks in this level: 298
Percentage of adults performing in this level: 32%

One of the easier Level 3 tasks requires the reader to write a brief letter explaining that an error has been made on a credit card bill. This task is at 280 on the prose scale. Other tasks in this level require the reader to search fairly dense text for information. Some of the tasks ask respondents to make a literal or synonymous match on more than a single feature, while other tasks ask them to integrate multiple pieces of information from a long passage that does not contain organizational aids.

One of the more difficult Level 3 tasks (with a difficulty value of 316) requires the reader to read a magazine article about an Asian-American woman and to provide two facts that support an inference made from the text. The question directs the reader to identify what Ida Chen did to help resolve conflicts due to discrimination.

List two things that Chen became involved in or has done to help resolve conflicts due to discrimination.

IDA CHEN is the first Asian-American woman to become a judge of the Commonwealth of Pennsylvania.

She understands discrimination because she has experienced it herself.

Soft-spoken and eminently dignified, Judge Ida Chen prefers hearing about a new acquaintance rather than talking about herself. She wants to know about career plans, hopes, dreams, fears. She gives unsolicited advice as well as encouragement. She instills confidence.

Her father once hoped that she would become a professor. And she would have also made an outstanding social worker or guidance counselor. The truth is that Chen wears the caps of all these professions as a Family Court judge of the Court of Common Pleas of Philadelphia County, as a participant in public advocacy for minorities, and as a particularly sensitive, caring person.

She understands discrimination because she has experienced it herself. As an elementary school student, Chen tried to join the local Brownie troop. "You can't be a member," she was told. "Only American girls are in the Brownies."

Originally intent upon a career as a journalist, she selected Temple University because of its outstanding journalism department and affordable tuition. Independence being a personal need, she paid for her tuition by working for Temple's Department of Criminal Justice. There she had her first encounter with the legal world and it turned her career plans in a new direction — law school.

Through meticulous planning, Chen was able to earn her undergraduate degree in two and a half years and she continued to work three jobs. But when she began her first semester as a Temple law student in the fall of 1973, she was barely able to stay awake. Her teacher Lynne Abraham, now a Common Pleas Court judge herself, couldn't help but notice Chen yawning in the back of the class, and when she determined that this student was not a party animal but a workhorse, she arranged a teaching assistant's job for Chen on campus.

After graduating from Temple Law School in 1976, Chen worked for the U.S. Equal Employment Opportunity Commission where she was a litigator on behalf of plaintiffs who experienced discrimination in the workplace, and then moved on to become the first Asian-American to serve on the Philadelphia Commission on Human Relations.

Appointed by Mayor Wilson Goode, Chen worked with community leaders to resolve racial and ethnic tensions and also made time to contribute free legal counsel to a variety of activist groups.

The "Help Wanted" section of the newspaper contained an entry that aroused Chen's curiosity — an ad for a judge's position. Her application resulted in her selection by a state judicial committee to fill a seat in the state court. And in July of 1988, she officially became a judge of the Court of Common Pleas. Running as both a Republican and Democratic candidate, her position was secured when she won her seat on the bench at last November's election.

At Family Court, Chen presides over criminal and civil cases which include adult sex crimes, domestic violence, juvenile delinquency, custody, divorce and support. Not a pretty picture.

Chen recalls her first day as judge, hearing a juvenile dependency case — "It was a horrifying experience. I broke down because the cases were so depressing," she remembers.

Outside of the courtroom, Chen has made a name for herself in resolving interracial conflicts, while glorying in her Chinese-American identity. In a 1986 incident involving the desecration of Korean street signs in a Philadelphia neighborhood, Chen called for a meeting with the leaders of that community to help resolve the conflict.

Chen's interest in community advocacy is not limited to Asian communities. She has been involved in Hispanic, Jewish and Black issues, and because of her participation in the Ethnic Affairs Committee of the Anti-Defamation League of B'nai B'rith, Chen was one of 10 women nationwide selected to take part in a mission to Israel.

With her recently won mandate to judicate in the affairs of Pennsylvania's citizens, Chen has pledged to work tirelessly to defend the rights of its people and contribute to the improvement of human welfare. She would have made a fabulous Brownie.

— *Jessica Schultz*

Prose Level 4 Scale range: 326 to 375

These tasks require readers to perform multiple-feature matches and to integrate or synthesize information from complex or lengthy passages. More complex inferences are needed to perform successfully. Conditional information is frequently present in tasks in this level and must be taken into consideration by the reader.

Average difficulty value of tasks in this level: 352
Percentage of adults performing in this level: 17%

A prose task with a difficulty value of 328 requires the reader to synthesize the repeated statements of an argument from a newspaper column in order to generate a theme or organizing principle. In this instance, the supporting statements are elaborated in different parts of a lengthy text.

A more challenging task (with a difficulty value of 359) directs the reader to contrast the two opposing views stated in the newspaper feature reprinted here that discusses the existence of technologies that can be used to produce more fuel-efficient cars.

Contrast Dewey's and Hanna's views about the existence of technologies that can be used to produce more fuel-efficient cars while maintaining the size of the cars.

Face-Off: Getting More Miles Per Gallon

Demand cars with better gas mileage

By Robert Dewey
Guest columnist

WASHINGTON — Warning: Automakers are resurrecting their heavy-metal dinosaurs, aka gas guzzlers.

Government reports show that average new-car mileage has declined to 28.2 miles per gallon — the 1986 level. To reverse this trend, Congress must significantly increase existing gas-mileage standards.

More than half our Nobel laureates and 700 members of the National Academy of Sciences recently called global warming "the most serious environmental threat of the 21st century." In 1989, oil imports climbed to a near-record 46% of U.S. consumption. Increasing gas mileage is the single biggest step we can take to reduce oil imports and curb global warming. Greater efficiency also lowers our trade deficit (oil imports represent 40% of it) and decreases the need to drill in pristine areas.

Bigger engines and bigger cars mean bigger profits for automakers, who offer us the products they want us to buy. More than ever, Americans want products that have less of an environmental impact. But with only a few fuel-efficient cars to choose from, how do we find ones that meet all our needs?

Government studies show automakers have the technology to dramatically improve gas mileage — while maintaining the 1987 levels of comfort, performance and size mix of vehicles. Automakers also have the ability to make their products safer. The cost of these improvements will be offset by savings at the gas pump!

Cars can average 45 mpg and light trucks 35 mpg primarily by utilizing engine and transmission technologies already on a few cars today. Further improvements are possible by using technologies like the two-stroke engine and better aerodynamics that have been developed but not used.

When the current vehicle efficiency standards were proposed in 1974, Ford wrongly predicted that they "would require either all sub-Pinto-sized vehicles or some mix of vehicles ranging from a sub-subcompact to perhaps a Maverick." At that time, Congress required a 100% efficiency increase; raising gas mileage to 45 mpg requires only a 60% increase.

Americans want comfortable, safe and efficient cars. If automakers won't provide them, Congress must mandate them when it considers the issue this summer.

Let's hope lawmakers put the best interest of the environment and the nation ahead of the automakers' lobbyists and political action committees.

Robert Dewey is a conservation analyst for the Environmental Action Foundation.

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Don't demand end to cars people want

By Thomas H. Hanna
Guest columnist

DETROIT — Do Americans look forward to the day when they'll have to haul groceries, shuttle the kids to and from school or take family vacations in compact and subcompact cars?

I doubt it — which is why U.S. and import carmakers oppose the 40-miles-per-gallon to 45 mpg corporate average fuel economy mandates that some are pushing in Congress, either to curb tailpipe carbon dioxide emissions because of alleged global warming or for energy conservation.

Since the mid-1970s, automakers have doubled the fleet average fuel economy of new cars to 28 mpg — and further progress will be made.

Compact and subcompact cars with mileage of 40 mpg or better are now available, yet they appeal to only 5% of U.S. car buyers.

But to achieve a U.S. fleet average of 40 mpg to 45 mpg, carmakers would have to sharply limit the availability of family-size models and dramatically trim the size and weight of most cars.

There simply are not magic technologies to meat such a standard.

Almost every car now sold in the USA would have to be drastically downsized, and many would be obsolete.

As a result, Americans each year would be unable to buy the vehicles most suited for their needs: mid- and family-size models, luxury automobiles, mini-vans, small trucks and utility vehicles.

The fleet shift to compacts and subcompacts could also force the closing of assembly plants, supplier firms and dealerships, at a cost of thousands of U S jobs

Although a growing number of scientists are skeptical of global warming, the issue deserves thorough international scientific evaluation, not premature unilateral U.S. action.

Carbon dioxide emissions from U.S. vehicles total less than 2.5% of worldwide "greenhouse" gases. Even doubling today's corporate average fuel economy for U.S. cars — if technically possible — would cut those gases about .5%

Whatever the motivation — alleged global warming or energy conservation — the stakes are high for millions of Americans and thousands of U.S. jobs in unrealistic corporate average fuel economy mandates.

Thomas H Hanna is president and chief executive officer of the Motor Vehicle Manufacturers Association of the United States

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Two other tasks in Level 4 on the prose scale require the reader to draw on background knowledge in responding to questions asked about two poems. In one they are asked to generate an unfamiliar theme from a short poem (difficulty value of 362), and in the other they are asked to compare two metaphors (value of 374).

Prose Level 5 Scale range: 376 to 500

Some *tasks in this level require the reader to search for information in dense text which contains a number of plausible distractors. Others ask readers to make high-level inferences or use specialized background knowledge. Some tasks ask readers to contrast complex information.*

Average difficulty value of tasks in this level: 423
Percentage of adults performing in this level: 3%

Two tasks in Level 5 require the reader to search for information in dense text containing several plausible distractors. One such task (difficulty value of 410) requires the respondent to read information about jury selection and service. The question requires the reader to interpret information to identify two ways in which prospective jurors may be challenged.

Identify and summarize the two kinds of challenges that attorneys use while selecting members of a jury.

DO YOU HAVE A QUESTION?

QUESTION: What is the new program for scheduling jurors?

ANSWER: This is a new way of organizing and scheduling jurors that is being introduced all over the country. The goals of this program are to save money, increase the number of citizens who are summoned to serve and decrease the inconvenience of serving.

The program means that instead of calling jurors for two weeks, jurors now serve only one day, or for the length of one trial if they are selected to hear a case. Jurors who are not selected to hear a case are excused at the end of the day, and their obligations to serve as jurors are fulfilled for three years. The average trial lasts two days once testimony begins.

An important part of what is called the One Day – One Trial program is the "standby" juror. This is a person called to the Courthouse if the number of cases to be tried requires more jurors than originally estimated. Once called to the Courthouse, the standby becomes a "regular" juror, and his or her service is complete at the end of one day or one trial, the same as everyone else.

Q. How was I summoned?

A. The basic source for names of eligible jurors is the Driver's License list which is supplemented by the voter registration list. Names are chosen from these combined lists by a computer in a completely random manner.

Once in the Courthouse, jurors are selected for a trial by this same computer and random selection process.

Q. How is the Jury for a particular trial selected?

A. When a group of prospective jurors is selected, more than the number needed for a trial are called. Once this group has been seated in the courtroom, either the Judge or the attorneys ask questions. This is called *voir dire*. The purpose of questions asked during *voir dire* is to ensure that all of the jurors who are selected to hear the case will be unbiased, objective and attentive.

In most cases, prospective jurors will be asked to raise their hands when a particular question applies to them. Examples of questions often asked are: Do you know the Plaintiff, Defendant or the attorneys in this case? Have you been involved in a case similar to this one yourself? Where the answer is yes, the jurors raising hands may be asked additional questions, as the purpose is to guarantee a fair trial for all parties. When an attorney believes that there is a legal reason to excuse a juror, he or she will challenge the juror for cause. Unless both attorneys agree that the juror should be excused, the Judge must either sustain or override the challenge.

After all challenges for cause have been ruled upon, the attorneys will select the trial jury from those who remain by exercising peremptory challenges. Unlike challenges for cause, no reason need be given for excusing a juror by peremptory challenge. Attorneys usually exercise these challenges by taking turns striking names from a list until both are satisfied with the jurors at the top of the list or until they use up the number of challenges allowed. Challenged jurors and any extra jurors will then be excused and asked to return to the jury selection room.

Jurors should not feel rejected or insulted if they are excused for cause by the Court or peremptorily challenged by one of the attorneys. The *voir dire* process and challenging of jurors is simply our judicial system's way of guaranteeing both parties to a lawsuit a fair trial.

Q. Am I guaranteed to serve on a jury?

A. Not all jurors who are summoned actually hear a case. Sometimes all the Judges are still working on trials from the previous day, and no new jurors are chosen. Normally, however, some new cases begin every day. Sometimes jurors are challenged and not selected.

A somewhat more demanding task (difficulty value of 423) involves the magazine article on Ida Chen reproduced earlier. This more challenging task requires the reader to explain the phrase "recently won mandate" used at the end of the text. To explain this phrase, the reader needs to understand the concept of a political mandate as it applies to Ida Chen and the way she is portrayed in this article.

Document Literacy

Another important aspect of being literate in modem society is having the knowledge and skills needed to process information from documents. We often encounter tables, schedules, charts, graphs, maps, and forms in everyday life, both at home and at work. In fact, researchers have found that many of us spend more time reading documents than any other type of material.[2] The ability to locate and use information from documents is therefore essential.

Success in processing documents appears to depend at least in part on the ability to locate information in complex arrays and to use this information in the appropriate ways. Procedural knowledge may be needed to transfer information from one source or document to another, as is necessary in completing applications or order forms.

The NALS document literacy scale contains 81 tasks with difficulty values that range from 69 to 396 on the scale. By examining tasks associated with various proficiency levels, we can identify characteristics that appear to make certain types of document tasks more or less difficult for readers. Questions and directives associated with these tasks are basically of four types: *locating, cycling, integrating*, and *generating*. Locating tasks require the readers to match one or more features of information stated in the question to either identical or synonymous information given in the document. Cycling tasks require the reader to locate and match one or more features, but differ in that they require the reader to engage in a series of feature matches to satisfy conditions given in the question. The integrating tasks typically require the reader to compare and contrast information in adjacent parts of the document. In the generating tasks, readers must produce a written response by processing information found in the document and also making text-based inferences or drawing on their own background knowledge.

[2] J.T. Guthrie, M. Seifert, and I.S. Kirsch. (1986). "Effects of Education, Occupation, and Setting on Reading Practices." *American Educational Research Journal*, 23. pp. 151-160.

As with the prose tasks, each type of question or directive extends over a range of difficulty as a result of interactions among several variables or task characteristics that include:

- the number of categories or features of information in the question that the reader has to process or match
- the number of categories or features of information in the document that can serve to distract the reader or that may seem plausible but are incorrect
- the extent to which the information asked for in the question is obviously related to the information stated in the document and
- the structure of the document

A more detailed discussion of the five levels of document literacy is provided in the following pages.

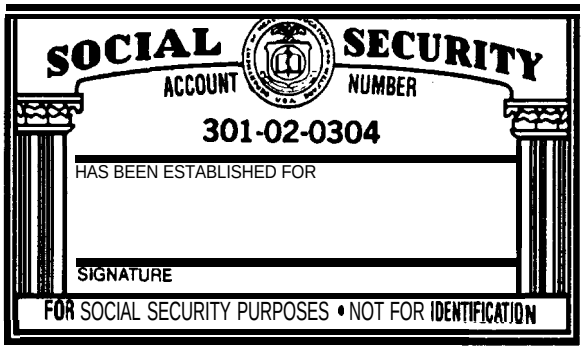
Document Level 1 **Scale range:** O to 225

Tasks in this level tend to require the reader either to locate a piece of information based on a literal match or to enter information from personal knowledge onto a document. Little, if any, distracting information is present.

Average difficulty value of tasks in this level: 195
Percentage of adults performing in this level: 23%

Some of the Level 1 tasks require the reader to match one piece of information in the directive with an identical or synonymous piece of information in the document. For example, readers may be asked to write a piece of personal background information — such as their name or age — in the appropriate place on a document. One task with a difficulty value of 69 directs individuals to look at a Social Security card and sign their name on the line marked "signature." Tasks such as this are quite simple, since only one piece of information is required, it is known to the respondent, and there is only one logical place on the document where it maybe entered.

Here is a Social Security card. Sign your name on the line that reads "signature."



Other tasks in this level are slightly more complex. For example, in one task, readers were asked to complete a section of a job application by providing several pieces of information. This was more complicated than the previous task described, since respondents had to conduct a series of one-feature matches. As a result, the difficulty value of this task was higher (193).

You have gone to an employment center for help in finding a job. You know that this center handles many different kinds of jobs. Also, several of your friends who have applied here have found jobs that appeal to you.

The agent has taken your name and address and given you the rest of the form to fill out. Complete the form so the employment center can help you get a job.

Birth date _____ Age ___ Sex: Male ___ Female ___
Height _____ Weight _____ Health _____
Last grade completed in school _____

Kind of work wanted:

Part-time _____ Summer _____
Full-time _____ Year-round _____

Other tasks in this level ask the reader to locate specific elements in a document that contains a variety of information. In one task, for example, respondents were given a form providing details about a meeting and asked to indicate the date and time of the meeting, which were stated in the form. The difficulty values associated with these tasks were 187 and 180, respectively. The necessary information was referred to only once in the document.

Document Level 2 Scale range: 226 to 275

Treks in this level are more varied than those in Level 1. Some require the reader to match a single piece of information; however, several distracters may be present, or the match may require low-level inferences. Tasks in this level may also ask the reader to cycle through information in a document or to integrate information from various parts of a document.

Average difficulty value of tasks in this level: 249
Percentage of adults performing in this level: 28%

Some tasks in Level 2 ask readers to match two pieces of information in the text. For example, one task with a difficulty value of 275 directs the respondent to look at a pay stub and to write "the gross pay for this year to date." To perform the task successfully, respondents must match both "gross pay" and "year to date" correctly. If readers fail to match on both features, they are likely to indicate an incorrect amount.

What is the gross pay for this year to date?

HOURS				PERIOD ENDING					
				03/15/85	REGULAR	OVERTIME	GROSS	DEF ANN	NET PAY
REGULAR	2ND SHIFT	OVERTIME	TOTAL	CURRENT	625.00		625.00		459.88
50.0			50.0	YEAR TO DATE			4268.85		

TAX DEDUCTIONS

	FED W/H	STATE W/H	CITY W/H	FICA
CURRENT	108.94	13.75		38.31
YEAR TO DATE	734.98	82.50		261.67

OTHER DEDUCTIONS

UNION		UNITED FD	PERS INS	MISC	MISC CODE
CR					

OTHER DEDUCTIONS

CODE	TYPE	AMOUNT	CODE	TYPE	AMOUNT
07	DEN	4.12			

NON-NEGOTIABLE

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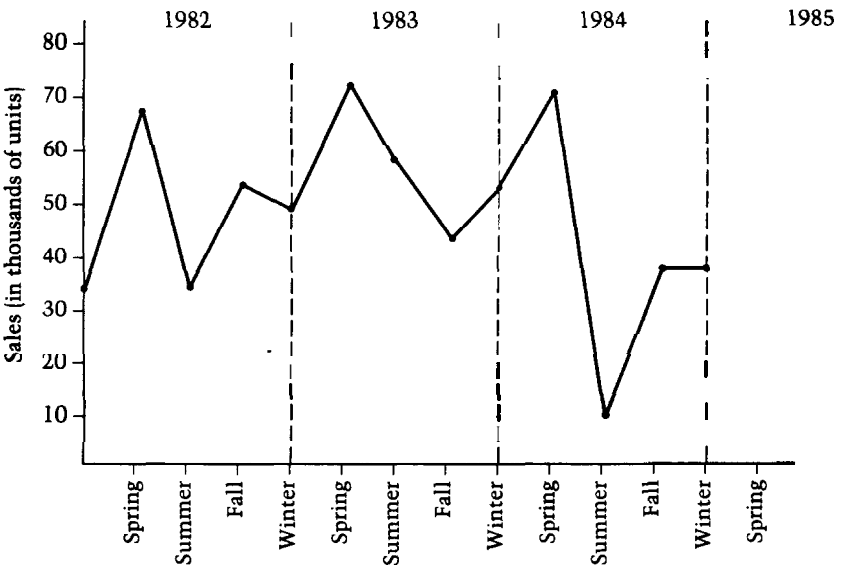
A second question based on this document — What is the current net pay? — was also expected to require readers to make a two-feature match. Accordingly, the difficulty values of the two items were expected to be similar. The task anchored at about the 224 point on the scale, however, and an analysis of the pay stub reveals why its difficulty was lower than that of the previous task. To succeed on the second task, the reader only needs to match on the feature "net pay." Since the term appears only once on the pay stub and there is only one number in the column, this task requires only a one-feature match and receives a difficulty value that lies within the Level 1 range on the document scale.

Tasks in Level 2 may also require the reader to integrate information from different parts of the document by looking for similarities or differences. For example, a task with a difficulty value of 260 asks respondents to study a line graph showing a company's seasonal sales over a three-year period, then predict the level of sales for the following year, based on the seasonal trends shown in the graph.

You are a marketing manager for a small manufacturing firm. This graph shows your company's sales over the last three years. Given the seasonal pattern shown on the graph, predict the sales for Spring 1985 (in thousands) by putting an "x" on the graph.



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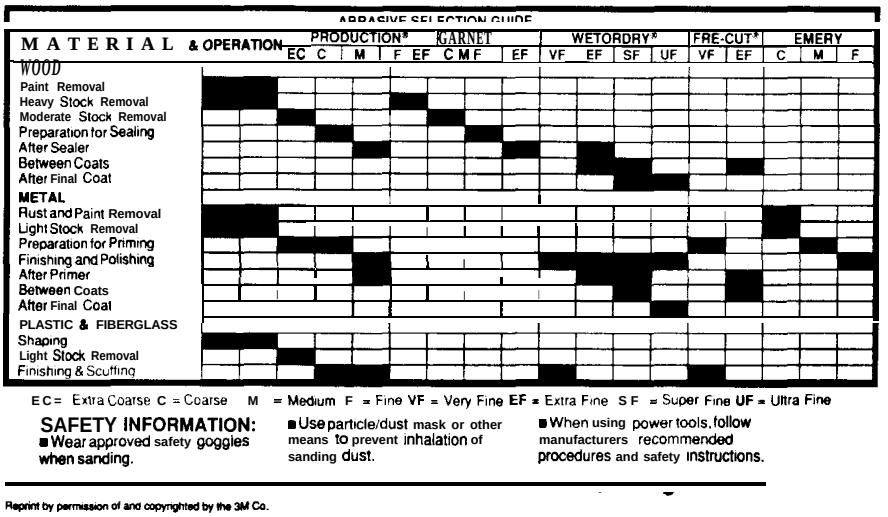
Document Level 3 Scale range: 276 to 325

Some tasks in this level require the reader to integrate multiple pieces of information from one or more documents. Others ask readers to cycle through rather complex tables or graphs which contain information that is irrelevant or inappropriate to the task.

Average difficulty value of tasks in this level: 302
Percentage of adults performing in this level: 31%

Tasks within the range for Level 3 ask the reader to locate particular features in complex displays, such as tables that contain nested information. Typically, distracter information is present in the same row or column as the correct answer. For example, the reader might be asked to use a table that summarizes appropriate uses for a variety of products, and then choose which product to use for a certain project. One such task had a difficulty value of 303. To perform this task successfully, the respondent uses a table containing nested information to determine the type of sandpaper to-buy if one needs "to smooth wood in preparation for sealing and plans to buy garnet sandpaper." This task requires matching not only on more than a single feature of information but also on features that are not always superordinate categories in the document. For example, "preparation for sealing" is subordinated or nested under the category "wood," while the type of sandpaper is under the main heading of "garnet." In addition, there are three other types of sandpaper that the reader might select that partially satisfy the directive.

You need to smooth wood in preparation for sealing and plan to buy garnet sandpaper. What type of sandpaper should you buy?



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At the same level of difficulty (307), another task directs the reader to a stacked bar graph depicting estimated power consumption by source for four different years. The reader is asked to select an energy source that will provide more power in the year 2000 than it did in 1971. To succeed on this task, the reader must first identify the correct years and then compare each of the five pairs of energy sources given.

Document Level 4 Scale range: 326 to 375

Tasks in this level, like those in the previous levels, ask readers to perform multiple-feature matches, cycle through documents, and integrate information; however, they require a greater degree of inferencing. Many of these tasks require readers to provide numerous responses but do not designate how many responses are needed. Conditional information is also present in the document tasks in this level and must be taken into account by the reader.

Average difficulty value of tasks in this level: 340
Percentage of adults performing in this level: 15%

One task in this level (348) combines many of the variables that contribute to difficulty in Level 4. These include: multiple feature matching, complex displays involving nested information, numerous distractors, and conditional information that must be taken into account in order to arrive at a correct response. Using the bus schedule shown here, readers are asked to select the time of the next bus on a Saturday afternoon, if they miss the 2:35 bus leaving Hancock and Buena Ventura going to Flintridge and Academy. Several departure times are given, from which respondents must choose the correct one.

On Saturday afternoon, if you miss the 2:35 bus leaving Hancock and Buena Ventura going to Flintridge and Academy, how long will you have to wait for the next bus?

ROUTE **5**

VISTA GRANDE

This bus line operates Monday through Saturday providing *"local service"* to most neighborhoods in the northeast section.
Buses run thirty minutes apart during the morning and afternoon rush hours Monday through Friday.
Buses run one-hour apart at all other times of day and Saturday
No Sunday, holiday or night service.

OUTBOUND
from Terminal

	Leave Downtown Terminal	Leave Hancock and Buena Ventura	Leave Citadel	Leave Rustic Hills	Leave North Carefree and Oro Blanco	Arrive Flintridge and Academy
AM	6:20	6:35	6:45	6:50	7:03	7:15
	6:50	**7:05**	**7:15**	**7:20**	**7:33**	**7:45**
	7:20	7:35	7:45	7:50	8:03	8:15
	7:50	**8:05**	**8:15**	**8:20**	**8:33**	**8:45**
	8:20	8:35	8:45	8:50	9:03	9:15
	8:50	**9:05**	**9:15**	**9:20**	**9:33**	**9:45**
	9:20	9:35	9:45	9:50	10:03	10:15
	10:20	10:35	10:45	10:50	11:03	11:15
	11:20	11:35	11:45	11:50	12:03	12:15
PM	12:20	12:35	12:45	12:50	1:03	1:15
	1:20	1:35	1:45	1:50	2:03	2:15
	2:20	2:35	2:45	2:50	3:03	3:15
	2:50	**3:05**	**3:15**	**3:20**	**3:33**	**3:45**
	3:20	3:35	3:45	3:50	4:03	4:15
	3:50	**4:05**	**4:15**	**4:20**	**4:33**	**4:45**
	4:20	4:35	4:45	4:50	5:03	5:15
	4:50	**5:05**	**5:15**	**5:20**	**5:33**	**5:45**
	5:20	5:35	5:45	5:50	6:03	6:15
	5:50	**6:05**	**6:15**	**6:20**	**6:33**	**6:45**
	6:20	6:35	6:45	6:50	7:03	7:15

INBOUND
toward Terminal

Leave Flintridge and Academy	Leave North Carefree and Oro Blanco	Leave Rustic Hills	Leave Citadel	Leave Hancock Buena Ventura	Arrive Downtown Terminal
6:15	6:27	6:42	6:47	6:57	7:15
6:45	**6:57**	**7:12**	**7:17**	**7:27**	**7:45** Monday through Friday only
7:15	7:27	7:42	7:47	7:57	8:15
7:45	**7:57**	**8:12**	**8:17**	**8:27**	**8:45** Monday through Friday only
8:15	8:27	8:42	8:47	8:57	9:15
8:45	**8:57**	**9:12**	**9:17**	**9:27**	**9:45** Monday through Friday only
9:15	9:27	9:42	9:47	9:57	10:15
9:45	**9:57**	**10:12**	**10:17**	**10:27**	**10:45** Monday through Friday only
10:15	10:27	10:42	10:47	10:57	11:15
11:15	11:27	11:42	11:47	11:57	12:15
12:15	12:27	12:42 p.m.	12:47 p.m.	12:57 p.m.	1:15 p.m.
1:15	1:27	1:42	1:47	1:57	2:15
2:15	2:27	2:42	2:47	2:57	3:15
3:15	3:27	3:42	3:47	3:57	4:15
3:45	**3:57**	**4:12**	**4:17**	**4:27**	**4:45** Monday through Friday only
4:15	4:27	4:42	4:47	4:57	5:15
4:45	**4:57**	**4:12**	**4:17**	**5:27**	**5:45** Monday through Friday only
5:15	5:27	5:42	5:47	5:57	6:15
5:45	**5:57**	**6:12**	**6:17**	**6:27**	**6:45** Monday through Friday only
					Monday through Friday only

You can transfer from this bus to another headed anywhere else in the city bus system

To be sure of a smooth transfer tell the driver of this bus the name of the second bus you need.

Other tasks involving this bus schedule are found in Level 3. These tasks require the reader to match on fewer features of information and do not involve the use of conditional information.

Document Level 5 **Scale** range: 376 to 500

Tasks in this level require the reader to search through complex displays that contain multiple distractors, to make high-level text-based inferences, and to use specialized knowledge.

Average difficulty value of tasks in this level: 391
Percentage of adults performing in this level: 3%

A task receiving a difficulty value of 396 involves reading and understanding a table depicting the results from a survey of parents and teachers evaluating parental involvement in their school. Respondents were asked to write a brief paragraph summarizing the results. This particular task requires readers to integrate the information in the table to compare and-contrast the viewpoints of parents and teachers on a selected number of school issues.

Using the information in the table, write a brief paragraph summarizing the extent to which parents and teachers agreed or disagreed on the statements about issues pertaining to parental involvement at their school.

Parents and Teachers Evaluate Parental Involvement at Their School

Do you agree or disagree that... ?

	Total	Level of School: Elementary	Junior High	High School
		percent agreeing		
Our school does a good job of encouraging parental involvement in sports, arts, and other nonsubject areas				
Parents	77	76	74	79
Teachers	77	73	77	85
Our school does a good job of encouraging parental involvement in educational areas				
Parents	73	82	71	64
Teachers	80	84	78	70
Our school only contacts parents when there is a problem with their child				
Parents	55	46	62	63
Teachers	23	18	22	33
Our school does not give parents the opportunity for any meaningful roles				
Parents	22	18	22	28
Teachers	8	8	12	7

Source: The Metropolitan Life Survey of the American Teacher, 1987

Quantitative Literacy

Since adults are often required to perform numerical operations in everyday life, the ability to perform quantitative tasks is another important aspect of literacy. These abilities may seem, at first glance, to be fundamentally different from the types of skills involved in reading prose and documents and, therefore, to extend the concept of literacy beyond its traditional limits. However, research indicates that the processing of printed information plays a critical role in affecting the difficulty of tasks along this scale.[3]

[3] I.S. Kirsch and A. Jungeblut. (1986). *Literacy: Profiles of America's Young Adults, Final Report*. Princeton, NJ: Educational Testing Service. I.S. Kirsch, A. Jungeblut, and A. Campbell. (1992). *Beyond the School Doors: The Literacy Needs of Job Seekers Served by the U.S. Department of Labor*. Princeton, NJ: Educational Testing Service.

The NALS quantitative literacy scale contains some 43 tasks with difficulty values that range from 191 to 436. The difficulty of these tasks appears to be a function of several factors, including:

- the particular arithmetic operation called for
- the number of operations needed to perform the task
- the extent to which the numbers are embedded in printed materials and
- the extent to which an inference must be made to identify the type of operation to be performed

In general, it appears that many individuals can perform simple arithmetic operations when both the numbers and operations are made explicit. However, when the numbers to be used must be located in and extracted from different types of documents that contain similar but irrelevant information, or when the operations to be used must be inferred from printed directions, the tasks become increasingly difficult.

A detailed discussion of the five levels of quantitative literacy is provided on the following pages.

Quantitative Level 1 **Scale range:** O to 225

Tasks in this level require readers to perform single, relatively simple arithmetic operations, such as addition. The numbers to be used are provided and the arithmetic operation to be performed is specified.

Average difficulty value of tasks in this level: 206
Percentage of adults performing in this level: 22%

The least demanding task on the quantitative scale (191) requires the reader to total two numbers on a bank deposit slip. In this task, both the numbers and the arithmetic operation are judged to be easily identified and the operation involves the simple addition of two decimal numbers that are set up in column format.

You wish to use the automatic teller machine at your bank to make a deposit. Figure the total amount of the two checks being deposited. Enter the amount on the form in the space next to TOTAL.

Availability of Deposits

Funds from deposits may not be available for immediate withdrawal. Please refer to your institution's rules governing funds availability for details.

Crediting of deposits and payments is subject to verification and collection of actual amounts deposited or paid in accordance with the rules and regulations of your financial institution.

PLEASE PRINT

YOUR MAC CARD NUMBER (No PINs PLEASE)
111 222 333 4

YOUR FINANCIAL INSTITUTION
Union Bank

YOUR ACCOUNT NUMBER
987 555 674

YOUR NAME
Chris Jones

CHECK ONE ☐ DEPOSIT or ☐ PAYMENT

CASH	$	00
LIST CHECKS BY BANK NO.	ENDORSE WITH NAME & ACCOUNT NUMBER	
	557	19
	75	00
TOTAL		

DO NOT DETACH TICKET

DO NOT FOLD NO COINS OR PAPER CLIPS PLEASE

Quantitative Level 2 **Scale** range: 226 to 275

Tasks in this level typically require readers to perform a single operation using numbers that are either stated in the task or easily located in the material. The operation to be performed may be stated in the question or easily determined from the format of the material (for example, an order form).

Average difficulty value of tasks in this level: 251
Percentage of adults performing in this level: 25%

In the easier tasks in Level 2, the quantities are also easy to locate. In one such task at 246 on the quantitative scale, the cost of a ticket and bus is given for each of two shows. The reader is directed to determine how much less attending one show will cost in comparison to the other.

The price of one ticket and bus for "Sleuth" costs how much less than the price of one ticket and bus for "On the Town"?

THEATER TRIP

A charter bus will leave from the bus stop (near the Conference Center) at 4 p.m., giving you plenty of time for dinner in New York. Return trip will start from West 45th Street directly following the plays. Both theaters are on West 45th Street. Allow about 1½ hours for the return trip.

Time: 4 p.m., Saturday, November 20

Price:	"On the Town"	Ticket and bus	$11.00
	"Sleuth"	Ticket and bus	$8.50

Limit: Two tickets per person

In a more complex set of tasks, the reader is directed to complete an order form for office supplies using a page from a catalogue. No other specific instructions as to what parts of the form should be completed are given in the directive. One task (difficulty value of 270) requires the reader to use a table on the form to locate the appropriate shipping charges based on the amount of a specified set of office supplies, to enter the correct amount on an order form, and then to calculate the total price of the supplies.

Quantitative Level 3 **Scale** range: 276 to 325

In tasks in this level, two or more numbers are typically needed to solve the problem, and these must be found in the material. The operation(s) needed can be determined from the arithmetic relation terms used in the question or directive.

Average difficulty value of tasks in this level: 293
Percentage of adults performing in this level: 31%

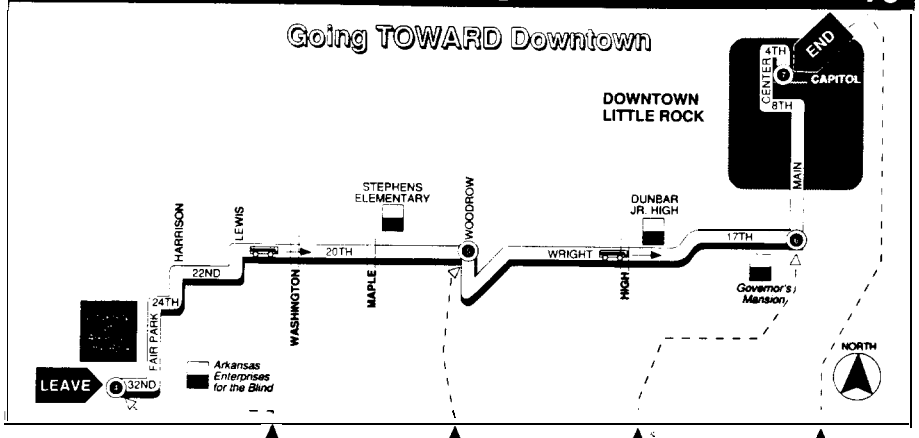
In general, tasks within the range for Level 3 ask the reader to perform a single operation of addition, subtraction, multiplication, or division. However, the operation is not stated explicitly in the directive or made clear by the format of the document. Instead, it must be inferred from the terms used in the directive. These tasks are also more difficult because the reader must locate the numbers in various parts of the document in order to perform the operation.

From a bar graph showing percentages of population growth for two groups across six periods, a task at the 279 point on the scale directs the reader to calculate the difference between the groups for one of the years.

A more difficult task in Level 3 (321) requires the use of a bus schedule to determine how long it takes to travel from one location to another on a Saturday. To respond correctly, the reader must match on several features of information given in the question to locate the appropriate times.

Suppose that you took the 12:45 p.m. bus from U.A.L.R. Student Union to 17th and Main on a Saturday. According to the schedule, how many minutes is the bus ride?

16 South Highland 16



4	5	6	7
BUS LEAVES from U. A.L.R. Student Union	Bus arrives at 20th & Wood row	Bus arrives at 17th & Main	BUS ENDS at Capitol & Louisiana

	WEEKDAYS			
A.M.	5:38	5:51	6:00	6:09
	6:11	6:25	6:35	6:45
	6:41	6:55	7:05	7:15
	7:11	7:25	7:35	7:45
	7:41	7:55	8:05	8:15
	8:11	8:25	8:35	8:45
	8:41	8:55	9:05	9:15
	9:14	9:27	9:36	9:45
	9:44	9:57	10:06	10:15
	10:14	10:27	10:36	10:45
	10:44	10:57	11:06	11:15
	11:14	11:27	11:36	11:45
	11:44	11:57	12:06	12:15
P.M.	12:14	12:27	12:36	12:45
	12:44	12:57	1:06	1:15
	1:14	1:27	1:36	1:45
	1:44	1:57	2:06	2:15
	2:14	2:27	2:36	2:45
	2:44	2:57	3:06	3:15
	3:14	3:27	3:36	3:45
	3:43	3:56	4:05	4:15
	4:13	4:26	4:35	4:45
	4:43	4:56	5:05	5:15
	5:13	5:26	5:35	5:45
	5:45	5:58	6:07	6:17
	6:11	6:22	6:30	
	6:46	6:57	7:05	

	SATURDAY			
A.M.	5:38	5:51	6:00	6:09
	6:45	6:57	7:06	7:15
	7:45	7:57	8:06	8:15
	8:45	8:57	9:06	9:15
	9:45-	9:57	10:06	10:15
	10:45	10:57	11:06	11:15
	11:45	11:57	12:06	12:15
P.M.	12:45	12:57	1:06	1:15
	1:45	1:57	2:06	2:15
	2:45	2:57	3:06	3:15
	3:45	3:57	4:06	4:15
	4:45	4:57	5:06	5:15
	5:45	5:57	6:06	6:15
	6:44	6:56	7:05	

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Quantitative Level 4 **Scale range: 326 to 375**

These tasks tend to require readers to perform two or more sequential operations or a single operation in which the quantities are found in different types of displays, or the operations must be inferred from semantic information given or drawn from prior knowledge.

Average difficulty value of tasks in this level: 349
Percentage of adults performing in this level: 17%

One task in this level, with a difficulty value of 332, asks the reader to estimate, based on information in a news article, how many miles per day a driver covered in a sled-dog race. The respondent must know that to calculate a "per day" rate requires the use of division.

A more difficult task (355) requires the reader to select from two unit price labels to estimate the cost per ounce of creamy peanut butter. To perform this task successfully, readers may have to draw some information from prior knowledge.

Estimate the cost per ounce of the creamy peanut butter. Write your estimate on the line provided.

Unit price	You pay
11.8¢ per oz.	1.89
rich chnky pnt bt	
10693	16 oz.

Unit price	You pay
1.59 per lb.	1.99
creamy pnt butter	
10732	20 oz.

Quantitative Level 5 Scale range: 376 to 500

These tasks require readers *to perform multiple operations sequentially. They must disembed the features of the problem from text or rely on background* knowledge *to* determine *the quantities or operations needed.*

Average difficulty value of tasks in this level: 411
Percentage of adults performing in this level: 4%

One of the most difficult tasks on the quantitative scale (433) requires readers to look at an advertisement for a home equity loan and then, using the information given, explain how they would calculate the total amount of interest charges associated with the loan.

You need to borrow $10,000. Find the ad for Home Equity Loans on page 2 in the newspaper provided. Explain to the interviewer how you would compute the total amount of interest charges you would pay under this loan plan. Please tell the interviewer when you are ready to begin.

FIXED RATE • FIXED TERM

HOME EQUITY LOANS

14.25%

Annual Percentage Rate
Ten Year Term

SAMPLE MONTHLY REPAYMENT SCHEDULE

Amount Financed	Monthly Payment
$10,000	$156.77
$25,000	$391.93
$40,000	$627.09

120 Months 14.25% APR

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Successful Task Performance across the Literacy Levels

The main purpose of the literacy scales is to summarize how well adults can perform on the full array of tasks in the assessment. The difficulty of the assessment tasks increases proportionally with the progression of information-processing demands across the scales. The literacy levels provide a way not only to explore this progression, but also to explore the likelihood that individuals in each level will succeed on tasks of varying difficulty.

The following graphs (Figure A.2) display the probability that individuals performing at selected points on each scale will give a correct response to tasks with varying difficulty values. For example, a person whose prose proficiency is 150 has less than a 50 percent chance of giving a correct response to an average prose task in Level 1, where the average task difficulty is 198. Individuals whose scores were at the 200 point, on the other hand, have an almost 80 percent probability of responding correctly to these tasks.

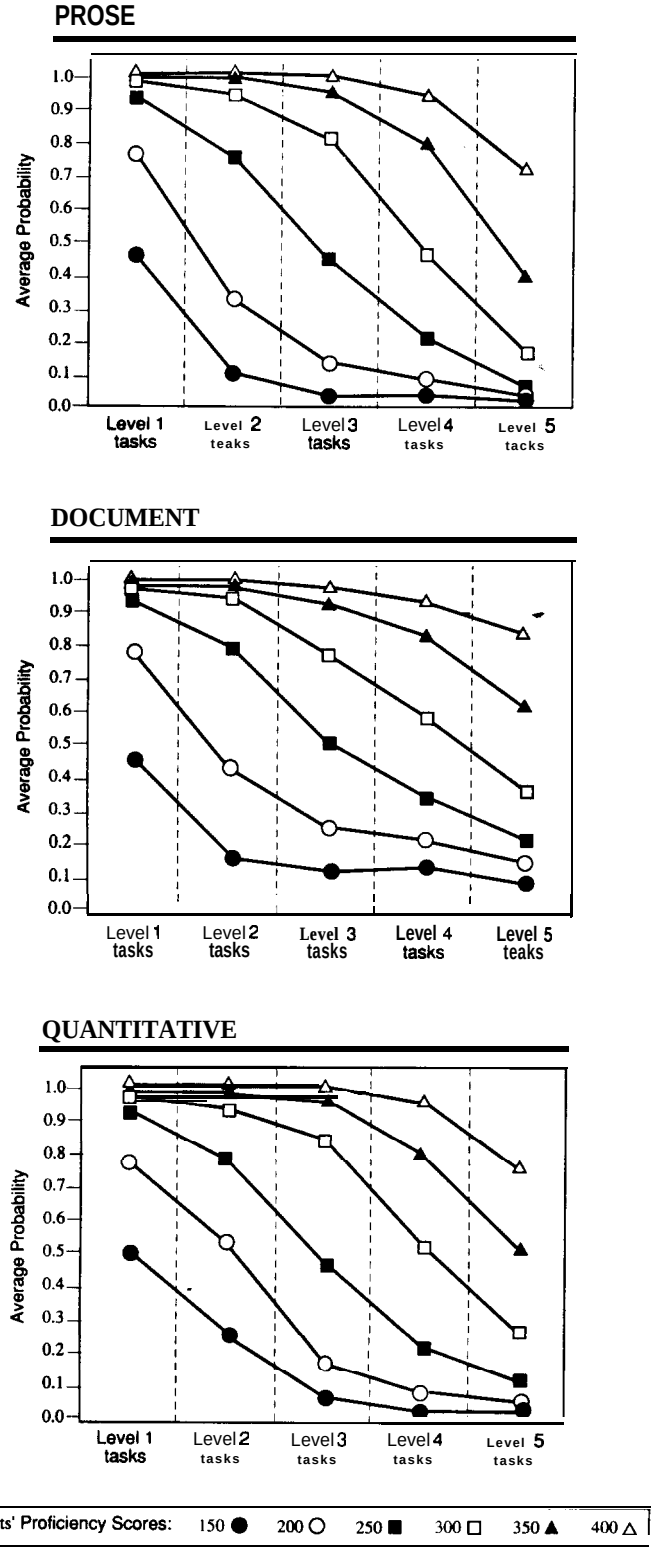
In terms of task demands, adults performing at the 200 point on the prose scale are likely to be able to locate a single piece of information in a brief piece of text where there is no distracting information, or when any distracting information is located apart from the desired information. They are likely to have far more difficulty with the types of tasks that occur in Levels 2 through 5, however. For example, they would have only about a 30 percent chance of performing the average task in Level 2 correctly, where the average task difficulty value is 259, and only about a 10 percent chance of success, or less, on the more challenging tasks found in Levels 3, 4, and 5.

In contrast, readers at the 300 point on the prose scale have more than an 80 percent probability of success on tasks in Levels 1 and 2, and have close to an 80 percent likelihood of success on tasks in Level 3, where the average task difficulty value is 298. This means that they demonstrate consistent success identifying information in fairly dense text without organizational aids. They can also consistently integrate, compare, and contrast information that is easily identified in the text. On the other hand, they are likely not to have mastered tasks that require them to make higher level inferences, to take conditional information into account, and to use specialized knowledge. The probabilities of their successfully performing these Level 4 tasks, where the average task difficulty value is 352, are just under 50 percent, and on the Level 5 tasks their likelihood of responding correctly falls to less than 20 percent.

Similar interpretations can be made using the performance results on the document and quantitative scales. For example, an individual with a proficiency of 150 on the document scale is estimated to have less than a 50 percent chance of responding correctly to tasks in Level 1, where the average task difficulty value is 195, and less than a 30 percent chance of responding

Figure A.2

Average Probabilities of Successful Performance by Individuals with Selected Proficiency Scores on the Tasks in Each Literacy Level



Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

correctly to tasks in each of the higher levels. On the quantitative literacy scale, adults with a proficiency of 150 are estimated to have only a 50 percent chance of responding correctly to an average document task in Level 1, where the average task difficulty is 206, and less than a 30 percent chance of responding correctly to tasks in the other levels. Such individuals demonstrate little or no proficiency in performing the range of quantitative tasks found in this assessment. In contrast, adults with a quantitative score of 300 exceed the 80 percent criterion for the average tasks in Levels 1 and 2 and meet the 80 percent criterion for many of the tasks in Level 3. They can be expected to encounter more difficulty with quantitative tasks in Levels 4 and 5.

Missing Responses to Literacy Tasks

In any educational, social, or political opinion survey, missing responses are always present. Sometimes missing data can be ignored when tabulating and reporting survey results. If the reasons the data are missing are related to the outcome of the study, however, the missing responses will bias the results unless some adjustment can be made to counter the bias. In this survey, there were reasons to believe that the literacy performance data were missing more often for adults with lower levels of literacy than for adults with higher levels. Field test evidence and experience with surveys indicated that adults with lower levels of literacy would be more likely than adults with higher proficiencies either to decline to respond to the survey at all or to begin the assessment but not to complete it. Ignoring the pattern of missing data would have resulted in overestimating the literacy skills of adults in the United States.

For this survey, several procedures were developed to reduce biases due to nonresponse, based on how much of the survey the respondent completed.[3] Individuals who refused to participate in the survey before any information about them was collected were omitted from the analyses. Because they were unlikely to know that the survey intended to assess their literacy, it was assumed that their reason for refusing was not related to their level of literacy skills.

Some individuals began the interview, but stopped before they completed at least five tasks on each literacy scale.[4] The interviewers were trained to record accurately their reasons for stopping. The reasons were subsequently

[3] For a full discussion of the procedures used in scoring, scaling, weighting, and handling nonresponse problems, see the forthcoming *Technical Report of the 1992 National Adult Literacy Survey*.

[4] Five was the minimum number of completed tasks needed for accurate proficiency estimation. No special procedures were needed to estimate the proficiencies of those who broke off the assessment after attempting five or more tasks on each scale.

classified as either related or unrelated to literacy skills. Literacy-related reasons included difficulty with reading or writing, inability to read or write in English, and mental or learning disabilities. Reasons unrelated to literacy included physical disabilities, time conflicts, and interruptions. Some adults gave no reason for stopping the assessment.

Overall, 88 percent of respondents completed the assessment (at least five tasks on each literacy scale). Twelve percent started the survey but stopped before completing five tasks. About half of these individuals, or 6 percent of the adult population, did not complete the assessment for reasons related to their literacy skills, while the other 6 percent did not complete it for reasons unrelated to literacy or for no stated reason.

The missing data were treated differently depending on whether nonrespondents' reasons were related or unrelated to their literacy skills. The missing responses of those who gave literacy-related reasons for terminating the assessment were treated as wrong answers, based on the assumption that they could not have correctly completed the literacy tasks. The missing responses of those who broke off the assessment for no stated reason or for reasons unrelated to literacy were essentially ignored, since it could not be assumed that their answers would have been either correct or incorrect. The proficiencies of such respondents were inferred from the performance of other adults with similar characteristics.

Table A.1 shows the proficiency scores resulting from these procedures. Adults who completed the assessment had average proficiencies ranging from 279 to 285 on the three literacy scales. Because the missing responses of adults who did not complete the assessment for reasons related to literacy were treated as wrong answers, the average scores of these adults were considerably lower, ranging from 114 to 124. Nearly all adults who terminated the assessment for literacy-related reasons scored in the Level 1 range (below 225). Adults who stopped for other reasons or for unstated reasons had scores between those of the other two groups, ranging from 228 to 237. These adults were not found only in the lowest literacy level, but were distributed across the five levels.

It is likely that there were some errors in classifying nonrespondents' reasons for not completing the assessment. Some adults may have given an explanation that reflected badly on their literacy skills simply because they found completing the assessment too burdensome. Perhaps they could have performed better if they had tried harder. The assumption that such adults are unable to succeed with the literacy tasks may be too strong, and the assignment of wrong answers may underestimate their skills. Other adults may have anticipated failure in the assessment, yet concealed their lack of literacy

Table A.1: Percentages and average proficiencies of adults on each scale, by assessment completion status

		Literacy scale		
		Prose	Document	Quantitative
Assessment completion status	CPCT	PROF (se)	PROF (se)	PROF (se)
Total	100	272 (0.6)	267 (0.7)	271 (0.7)
Completed assessment	88	285 (0.6)	279 (0.6)	284 (0.6)
Did not complete assessment for literacy-related reasons	6	124 (1.5)	116 (1.4)	114 (1.9)
Did not complete assessment for reasons unrelated to literacy	6	237 (3.0)	228 (2.8)	231 (3.6)

Notes: CPCT = column percentage; PROF = average proficiency; se = standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

skills by citing other reasons for not responding, or by refusing to explain their reason. The assumption that these adults are just like others in their demographic group may also be too strong, and the failure to assign wrong answers may overestimate their skills. To some extent the errors can be expected to counterbalance one another, but the available data are insufficient to assess which kind of classification error occurred more often.

Performance in the Lowest Literacy Level

Level 1 is somewhat different from the other literacy levels. For Levels 2 through 5, adults who can consistently perform the tasks in a given level (that is, at least 80 percent of the time) are said to perform in that level. For example, adults in Level 2 have a high probability of success on the tasks in that level, and more than an 80 percent likelihood of success on the Level 1 tasks. Likewise, adults in Level 3 have a high probability of success on the tasks in that level, as well as on the tasks in Levels 1 and 2.

Level 1, on the other hand, includes adults with a wide range of literacy skills, including some who performed the Level 1 tasks consistently and others who did not. Individuals who do not have an 80 percent probability of success with Level 1 tasks are still grouped in Level 1. Thus, some but not all adults in this level met the relatively undemanding requirements of the Level 1 tasks. This section describes how many adults in Level 1 did not meet the demands of the tasks in this level.

The failure to perform correctly at least one of the literacy tasks can be taken as an indicator of not being able to meet the demands of tasks in Level 1. Table A.2 provides information on the size of the groups that met or did not meet the relatively undemanding requirements of the Level 1 tasks.

Most adults in the lowest literacy level on each scale performed at least one literacy task correctly. Nearly three-quarters (72 percent) of adults in Level 1 on the prose scale performed at least one task correctly, as did 83 percent of those in Level 1 on the document scale and 66 percent of those in Level 1 on the quantitative scale. The difference in performance among the scales occurs because the least difficult document task had a value of 68, while the least difficult prose task had a value of 149 and the least difficult quantitative task had a value of 191.

Table A.2: Percentages and average proficiencies on each scale of adults in Level 1

	Literacy scale					
	Prose		Document		Quantitative	
Performance	CPCT	PROF	CPCT	PROF	CPCT	PROF
Total in Level 1	100	173	100	172	100	167
At least one task correct	72	190	83	182	66	190
No tasks correct	21	113	11	94	26	110
No performance data	7	177	6	177	8	159

Notes: CPCT = column percentage; PROF = average proficiency.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

A small proportion of adults in Level 1 did not perform any literacy tasks correctly. Some of these adults completed the survey, while others did not for literacy-related or other reasons. Those who did not succeed on any literacy tasks constitute 21 percent of adults in Level 1 on the prose scale, 11 percent of adults in Level 1 on the document scale, and 26 percent of adults in Level 1 on the quantitative scale. There are wide disparities in average proficiencies between those who performed at least one task correctly (182 to 190 across the scales) and those who did not (94 to 113 across the scales).

For some adults in Level 1 (6 to 8 percent) there are no literacy performance data because they did not respond to any of the literacy tasks for reasons unrelated to their literacy skills or for unknown reasons. These persons could not be described as either meeting or failing to meet the demands of the literacy tasks, so they are distinguished as a separate group. Their proficiencies

were inferred from the performance of other adults with similar demographic backgrounds and fell in the middle range between the other two groups. Nearly all adults who correctly responded to at least one literacy task also completed the assessment. Still, some adults broke off the assessment after already having shown some initial success. Table A.3 divides adults in Level 1 who were successful with at least one task into two groups: those who completed the assessment (at least five literacy tasks) and those who did not.

Across the scales, from 83 to 90 percent of those in Level 1 who correctly responded to at least one task also completed the assessment. Their average scores ranged from 192 to 196. The remainder (10 to 17 percent) performed at least one task correctly before breaking off the assessment. Their average scores were much lower, ranging from 132 to 153.

Table A.3: Percentages and average proficiencies of adults in Level 1 with at least one task correct, by assessment completion status

	Literacy scale					
	Prose		Document		Quantitative	
Completion status	CPCT	PROF	CPCT	PROF	CPCT	PROF
Total in Level 1 with at least one task correct	100	190	100	182	100	190
Completed assessment	87	196	83	192	90	194
Did not complete assessment	13	153	17	132	10	153

Notes: CPCT = column percentage; PROF = average proficiency.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

The population of adults who scored in Level 1 on each scale includes not only those who demonstrated success with at least some of the tasks in Level 1 — who constituted the majority — but also those who did not succeed with any of the tasks in this level. Nearly all of those in Level 1 who did not perform any literacy tasks correctly also failed to complete the assessment (86 to 98 percent), as shown in table A.4. Their average scores range from 93 to 107 across the scales. Most of these adults either did not start or broke off the assessment for literacy-related reasons, so that any literacy tasks that remained unanswered were treated as incorrect.

Table A.4: Percentages and average proficiencies of adults in Level 1 with no tasks correct, by assessment completion status

	Literacy scale					
	Prose		Document		Quantitative	
Completion status	CPCT	PROF	CPCT	PROF	CPCT	PROF
Total in Level 1 with no tasks correct	100	113	100	94	100	110
Completed assessment	14	148	2	----	14	146
Did not complete assessment	86	107	98	93	86	98

Notes: CPCT = column percentage; PROF = average proficiency.
---- indicates that the cell size is too small to provide reliable proficiency estimates.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Two to 14 percent of the adults in Level 1 who did not succeed on any of the literacy tasks did, in fact, complete the assessment. Their average scores were 148 on the prose scale and 146 on the quantitative scale; too few cases were available to estimate an average document score.

The pattern of Level 1 proficiencies associated with various combinations of missing and incorrect answers shows the consequences of including, rather than excluding, adults who did not complete the assessment for literacy-related reasons. In general, the very low scores of these adults bring down the average for any group in which they area significant component. Omitting these persons from the assessment would have resulted in inflated estimates of the literacy skills of the adult population overall and particularly of certain subgroups.

Population Diversity within the Lowest Literacy Level

Certain populations of adults were disproportionately likely not to meet the demands of the Level 1 tasks. This section describes the characteristics of adults in Level 1 who did not meet the relatively undemanding requirements of the tasks in this level. Tables A.5P, D, and Q provide information on the demographic composition of the total adult population in this country, of adults in Level 1 on each literacy scale, and of those adults in Level 1 who did not succeed on any of the assessment tasks.

Table A.5P: Percentages of adults in selected groups, by membership in total U.S. population, in Level 1, and in Level 1 with no tasks correct

	Prose scale		
	Total U.S. population	Level 1 population	Level 1 no tasks correct
Population group	CPCT	CPCT	CPCT
Weighted sample size (in millions)	191.3	40.0	8.2
Country of birth			
Born in another country	10	25 (1.3)	55 (2.2)
Highest level of education			
O to 8 years	10	35 (1.6)	61 (2.3)
9 to 12 years	13	27 (1.3)	17 (1.5)
HS diploma or GED	30	24 (1.4)	14 (1.5)
Race/Ethnicity			
White	76	51 (0.6)	29 (2.3)
Black	11	20 (1.0)	15 (1.4)
Hispanic	10	23 (1.4)	49 (2.1)
Asian/Pacific Islander	2	4 (3.9)	5 (0.9)
Age			
16 to 24 years	18	13 (0.8)	10 (1.2)
65 years and older	16	33 (1.5)	28 (1.8)
Disability or condition			
Any condition	12	26 (1.0)	26 (1.7)
Visual difficulty	7	19 (1.5)	20 (1.5)
Hearing difficulty	7	13 (1.6)	13 (2.0)
Learning disability	3	9 (2.1)	15 (1.4)

Notes: CPCT = column percentage; se = standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table A.5D: Percentages of adults in selected groups, by membership in total U.S. population, in Level 1, and in Level 1 with no tasks correct

	Document scale		
	Total U.S. population	Level 1 population	Level 1 no tasks correct
Population group	CPCT	CPCT	CPCT
Weighted sample size (in millions)	191.3	44.0	4.7
Country of birth			
Born in another country	10	22 (1.3)	67 (3.2)
Highest level of education			
O to 8 years	10	33 (1.5)	65 (3.1)
9 to 12 years	13	26 (1.5)	12 (1.7)
HS diploma or GED	30	26 (1.7)	13 (2.1)
Race/Ethnicity			
White	76	54 (0.7)	21 (3.0)
Black	11	20 (0.9)	9 (1.1)
Hispanic	10	21 (1.7)	62 (3.2)
Asian/Pacific Islander	2	3 (3.2)	5 (1.6)
Age			
16 to 24 years	18	11 (0.6)	11 (1.8)
65 years and older	16	35 (1.5)	25 (2.2)
Disability or condition			
Any condition	12	26 (1.2)	22 (2.5)
Visual difficulty	7	18 (1.3)	17 (2.3)
Hearing difficulty	7	13 (2.0)	12 (2.0)
Learning disability	3	8 (2.3)	14 (1.6)

Notes: CPCT = column percentage; se = standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

While 10 percent of the adult population reported that they were born in another country, from 22 to 25 percent of the individuals who performed in Level 1 on the three scales and 54 to 67 percent of those in Level 1 who did not perform any tasks correctly were foreign born. Some of these individuals were undoubtedly recent immigrants with a limited command of English.

Table A.5Q: Percentages of adults in selected groups, by membership in total U.S. population, in Level 1, and in Level 1 with no tasks correct

	Quantitative scale		
	Total U.S. population	Level 1 population	Level 1 no tasks correct
Population group	CPCT	CPCT	CPCT
Weighted sample size (in millions)	191.3	42.0	10.6
Country of birth			
Born in another country	10	22 (1.2)	54 (2.0)
Highest level of education			
0 to 8 years	10	33 (1.6)	58 (2.5)
9 to 12 years	13	27 (1.5)	20 (1.5)
HS diploma or GED	30	25 (1.6)	13 (1.3)
Race/Ethnicity			
White	76	50 (0.5)	34 (2.2)
Black	11	23 (0.9)	19 (1.2)
Hispanic	10	22 (1.3)	40 (1.9)
Asian/Pacific Islander	2	3 (3.6)	5 (0.9)
Age			
16 to 24 years	18	14 (0.8)	10 (0.9)
65 years and older	16	32 (1.5)	32 (1.7)
Disability or condition			
Any condition	12	26 (1.2)	28 (1.4)
Visual difficulty	7	19 (1.4)	21 (1.4)
Hearing difficulty	7	12 (2.1)	13 (1.5)
Learning disability	3	8 (2.7)	15 (1.0)

Notes: CPCT = column percentage; se = standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Adults who did not complete high school were also disproportionately represented at the low end of the literacy scales. While 23 percent of the adult population reported that they had not completed high school, 59 to 62 percent of adults who performed in Level 1 on the three scales and 77 to 78 percent of those in Level 1 with no tasks correct said they had not completed high school or its equivalent.

Relatively high percentages of the respondents in Level 1 were Black, Hispanic, or Asian/Pacific Islander. The largest group among those who did not perform any tasks correctly were Hispanic. Hispanics and Asian/Pacific Islanders are more likely than others to be recent immigrants with a limited command of English.

Older adults were overrepresented in the Level 1 population as well as in the population of adults who did not meet the demands of the Level 1 tasks. While 16 percent of the total U.S. population was age 65 or older, approximately one-third of the Level 1 population and 25 to 32 percent of the adults in Level 1 who performed no literacy tasks correctly were in this age group. In contrast, compared with their representation in the total U.S. population (18 percent), younger adults were underrepresented in Level 1 (11 to 14 percent) and in the subgroup of Level 1 that did not succeed on any of the literacy tasks (10 to 11 percent).

Disabilities are sometimes associated with low literacy performance. While 12 percent of the adult population reported having a physical, mental, or health condition that kept them from participating fully in work and other activities, 26 percent of adults who performed in Level 1 and 22 to 28 percent of those in Level 1 who did not succeed on any of the literacy tasks had such conditions. Further, while only 3 percent of the U.S. population reported having a learning disability, 8 to 9 percent of the adults who performed in Level 1 on the prose, document, and quantitative scales and 14 to 15 percent of those in Level 1 who did not succeed on any task had this type of disability.

These results show that adults in some population groups were disproportionately likely to perform in the lowest literacy level, and among those who performed in this level, were disproportionately likely not to succeed on any of the literacy tasks in the assessment.

APPENDIX B

Additional Tables

Table B1-1
Percentages and average document proficiencies of older and younger adults, by self-reported literacy proficiencies

AREA OF LITERACY/ AGE			SELF-REPORTED PROFICIENCY		
			Very well	Well	Not well or not at all
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
Understand					
60 and older	3,709	39,417	78 (1.0)	19 (0.9)	3 (0.3)
			235 (1.7)	201 (3.2)	115 (7.5)!
16 to 59	22,367	151,788	82 (0.5)	14 (0.5)	3 (0.2)
			289 (0.6)	248 (1.8)	132 (2.6)
Speak					
60 and older	3,708	39,385	68 (1.1)	28 (1.1)	4 (0.5)
			235 (1.8)	212 (3.1)	133 (9.1)!
16 to 59	22,360	151,696	73 (0.9)	23 (0.8)	4 (0.2)
			292 (0.7)	259 (1.4)	143 (2.9)
Read					
60 and older	3,701	39,319	66 (1.1)	25 (1.0)	8 (0.7)
			240 (1.7)	213 (3.0)	136 (4.0)
16 to 59	22,340	151,608	72 (0.7)	22 (0.6)	7 (0.3)
			295 (0.6)	259 (1.2)	156 (2.9)
Write					
60 and older	3,692	39,219	60 (1.4)	28 (1.2)	12 (1.0)
			242 (2.0)	218 (2.6)	157 (3.6)
16 to 59	22,307	151,429	65 (0.8)	26 (0.7)	9 (0.3)
			295 (0.6)	267 (1.2)	181 (2.6)
Do arithmetic					
60 and older	3,706	39,350	50 (1.2)	33 (1.0)	17 (0.9)
			244 (2.0)	223 (2.8)	170 (3.4)
16 to 59	22,355	151,673	54 (0.9)	35 (0.8)	11 (0.3)
			298 (0.8)	270 (0.9)	203 (2.5)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate (the true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty).

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B1.2

Percentages and average quantitative proficiencies of older and younger adults, by self-reported literacy proficiencies

AREA OF LITERACY/ AGE			SELF-REPORTED PROFICIENCY		
			Very well	Well	Not well or not at all
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
Understand					
60 and older	3,709	39,417	78 (1.0)	19 (0.9)	3 (0.3)
			246 (2.2)	216 (3.8)	92 (6.9)!
16 to 59	22,367	151,788	82 (0.5)	14 (0.5)	3 (0.2)
			292 (0.6)	252 (2.1)	133 (2.9)
Speak					
60 and older	3,708	39,385	68 (1.1)	28 (1.1)	4 (0.5)
			246 (2.1)	228 (3.8)	114 (10.2)!
16 to 59	22,360	151,696	73 (0.9)	23 (0.8)	4 (0.2)
			294 (0.6)	263 (1.5)	145 (2.7)
Read					
60 and older	3,701	39,319	66 (1.1)	25 (1.0)	8 (0.7)
			254 (2.1)	227 (3.7)	121 (5.8)
16 to 59	22,340	151,608	72 (0.7)	22 (0.6)	7 (0.3)
			297 (0.6)	263 (1.3)	157 (2.7)
Write					
60 and older	3,692	39,219	60 (1.4)	28 (1.2)	12 (1.0)
			255 (2.5)	234 (3.4)	149 (5.0)
16 to 59	22,307	151,429	65 (0.8)	26 (0.7)	9 (0.3)
			298 (0.6)	271 (1.4)	182 (2.6)
Do arithmetic					
60 and older	3,706	39,350	50 (1.2)	33 (1.0)	17 (0.9)
			260 (2.5)	237 (3.4)	161 (4.7)
16 to 59	22,355	151,673	54 (0.9)	35 (0.8)	11 (0.3)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B21
Percentages and average literacy proficiencies of older and younger adults by race/ethnicity, by self-reported writing proficiency

AGE RACE/ETHNICITY LITERACY SCALE			SELF-REPORTED PROFICIENCY		
			Very well	Well	Not well or not at all
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
60 and older					
White	2,744	32,898	64 (1.6)	28 (1.5)	9 (0.9)
Prose			261 (2.1)	236 (2.8)	183 (4.0)
Document			245 (2.1)	223 (2.9)	182 (4.7)
Quantitative			260 (2.6)	240 (3.4)	182 (5.6)
Black	626	3,350	45 (2.2)	35 (2.4)	20 (2.0)
Prose			214 (4.6)	202 (3.8)	137 (7.4)!
Document			198 (4.1)	191 (3.7)	129 (5.7)!
Quantitative			191 (5.6)	194 (5.9)	104 (8.2)!
Hispanic	263	1,997	24 (3.4)	22 (3.3)	54 (3.1)
Prose			249 (9.8)!	201 (9.8)!	138 (8.2)
Document			230 (11.2)!	197 (7.7)!	121 (6.3)
Quantitative			244 (14.7)!	214 (6.5)!	105 (8.8)
16 to 59					
White	14,493	111,570	70 (1.0)	26 (0.9)	4 (0.2)
Prose			308 (0.8)	282 (1.5)	228 (3.4)
Document			304 (0.8)	279 (1.5)	231 (3.7)
Quantitative			307 (0.8)	284 (1.6)	233 (3.6)
Black	4,315	17,776	61 (0.9)	32 (0.9)	7 (0.4)
Prose			258 (1.6)	236 (2.1)	166 (4.6)
Document			251 (1.4)	231 (1.9)	167 (4.9)
Quantitative			246 (1.8)	225 (2.1)	161 (5.0)
Hispanic	2,852	16,434	40 (1.5)	22 (1.0)	37 (1.5)
Prose			276 (2.2)	242 (2.7)	144 (2.9)
Document			274 (2.3)	242 (2.8)	146 (3.2)
Quantitative			271 (2.3)	242 (3.0)	146 (3.4)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B2.2
Percentages and average literacy proficiencies of older and younger adults by race/ethnicity, by self-reported arithmetic proficiency

AGE RACE/ETHNICITY LITERACY SCALE			SELF-REPORTED PROFICIENCY		
			Very well	Well	Not well or not at all
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
60 and older					
White	2,756	33,024	55 (1.3)	33 (1.1)	12 (0.8)
Prose			261 (2.0)	243 (2.7)	200 (5.6)
Document			247 (2.0)	228 (2.9)	190 (4.8)
Quantitative			265 (2.6)	244 (3.3)	186 (5.8)
Black	628	3,355	31 (1.7)	38 (2.4)	30 (2.2)
Prose			215 (6.7)!	203 (4.4)	161 (6.8)!
Document			202 (5.8)!	193 (3.3)	146 (4.8)!
Quantitative			203 (9.3)!	190 (6.0)	126 (7.7)!
Hispanic	263	1,997	23 (2.8)	23 (3.3)	54 (3.6)
Prose			244 (10.6)!	191 (10.6)!	147 (9.0)
Document			231 (8.1)!	185 (12.4)!	126 (6.6)
Quantitative			247 (12.3)!	199 (13.3)!	111 (8.8)
16 to 59					
White	14,518	111,728	58 (1.1)	34 (0.9)	7 (0.4)
Prose			311 (0.9)	287 (1.3)	249 (2.5)
Document			307 (1.0)	282 (1.3)	245 (2.5)
Quantitative			313 (0.9)	285 (1.3)	241 (2.7)
Black	4,328	17,813	45 (1.0)	43 (1.1)	12 (0.4)
Prose			259 (2.0)	243 (1.8)	195 (4.5)
Document			253 (1.8)	237 (1.5)	192 (3.8)
Quantitative			251 (2.0)	231 (1.6)	179 (4.1)
Hispanic	2,862	16,483	36 (1.6)	30 (1.5)	34 (1.6)
Prose			272 (2.3)	234 (2.5)	150 (2.9)
Document			271 (2.3)	235 (2.7)	149 (3.0)
Quantitative			271 (2.5)	233 (2.6)	147 (2.9)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B2.3
Percentages and average literacy proficiencies of older and younger adults by sex, by self-reported writing proficiency

AGE SEX/ LITERACY SCALE			SELF-REPORTED PROFICIENCY		
			Very well	Well	Not well or not at all
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
60 and older					
Male	1,389	17,421	56 (2.2)	28 (1.8)	16 (1.5)
Prose			264 (3.1)	231 (3.8)	159 (6.0)
Document			251 (2.7)	222 (3.8)	164 (4.5)
Quantitative			272 (3.4)	248 (4.5)	160 (6.3)
Female	2,298	21,766	62 (1.3)	28 (1.2)	10 (0.9)
Prose			253 (2.0)	230 (3.2)	160 (4.6)!
Document			235 (2.4)	215 (3.0)	149 (5.4)!
Quantitative			243 (2.9)	224 (4.1)	135 (5.7)!
16 to 59					
Male	0,355	74,501	59 (0.9)	31 (0.8)	11 (0.4)
Prose			300 (0.8)	272 (1.5)	186 (3.0)
Document			298 (0.9)	272 (1.5)	189 (2.8)
Quantitative			304 (1.2)	278 (1.6)	192 (3.2)
Female	1,919	76,695	71 (0.8)	22 (0.8)	7 (0.3)
Prose			300 (0.9)	268 (1.8)	168 (3.8)
Document			293 (0.8)	262 (1.7)	169 (4.2)
Quantitative			293 (0.8)	262 (1.8)	167 (4.2)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

TABLE B2:4

Percentages and average literacy proficiencies of older and younger adults by sex, by self-reported arithmetic proficiency

AGE SEX/ LITERACY SCALE			SELF-REPORTED PROFICIENCY		
			Very well	Well	Not well or not at all
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
60 and older					
Male	1,393	17,475	56 (1.8)	30 (1.7)	14 (1.1)
Prose			261 (3.1)	229 (4.0)	163 (6.9)
Document			251 (2.7)	220 (3.7)	161 (5.5)
Quantitative			273 (3.6)	242 (4.6)	154 (8.2)
Female	2,308	21,843	46 (1.5)	36 (1.4)	19 (1.2)
Prose			253 (2.5)	241 (2.7)	191 (4.3)
Document			237 (2.8)	225 (3.3)	175 (3.8)
Quantitative			247 (3.4)	234 (3.6)	165 (4.5)
16 to 59					
Male	10,369	74,563	56 (1.0)	34 (0.8)	10 (0.4)
Prose			300 (1.0)	271 (1.4)	192 (3.5)
Document			299 (1.0)	269 (1.2)	192 (3.6)
Quantitative			307 (1.2)	273 (1.3)	190 (3.6)
Female	11,953	76,878	52 (1.0)	36 (0.9)	12 (0.4)
Prose			304 (1.2)	278 (1.3)	216 (2.8)
Document			298 (1.2)	271 (1.3)	212 (2.8)
Quantitative			300 (1.2)	270 (1.2)	205 (2.7)

n = sample size WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B4.1
Percentages and average document proficiencies of older and younger adults by reliance on various sources of information

SOURCE/ AGE			AMOUNT OF INFORMATION			
			A lot	Some	A little	None
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
Newspapers						
60 and older	3,693	39,383	53 (1.0)	27 (0.9)	11 (0.5)	9 (0.6)
			239 (1.7)	226 (2.1)	199 (4.7)	166 (4.8)
16 to 59	21,231	151,022	41 (0.6)	36 (0.5)	17 (0.4)	6 (0.2)
			288 (0.9)	280 (1.0)	268 (1.5)	223 (2.7)
Magazines						
60 and older	3,684	39,266	22 (0.9)	35 (0.9)	21 (0.8)	22 (0.9)
			239 (2.8)	241 (1.9)	226 (2.8)	184 (3.2)
16 to 59	21,220	150,914	17 (0.4)	41 (0.5)	29 (0.5)	13 (0.3)
			287 (1.6)	288 (0.8)	280 (1.2)	233 (1.8)
Radio						
60 and older	3,692	39,323	28 (1.0)	28 (0.8)	23 (0.8)	20 (1.0)
			217 (2.3)	233 (2.7)	233 (2.9)	213 (3.2)
16 to 59	21,217	150,940	38 (0.5)	35 (0.5)	21 (0.4)	6 (0.2)
			275 (1.1)	285 (1.0)	278 (1.2)	252 (2.7)
Television						
60 and older	3,695	39,374	74 (1.1)	19 (0.8)	5 (0.4)	2 (0.3)
			223 (1.6)	236 (2.8)	221 (7.8)!	180 (13.2)!
16 to 59	21,224	150,975	65 (0.6)	25 (0.5)	9 (0.3)	2 (0.2)
			272 (0.7)	291 (1.2)	284 (2.1)	279 (5.5)
Family members						
60 and older	3,686	39,288	20 (0.8)	40 (1.0)	28 (0.8)	13 (0.7)
			214 (3.3)	231 (2.4)	235 (2.1)	199 (3.9)
16 to 59	21,215	150,937	23 (0.4)	45 (0.5)	26 (0.4)	5 (0.2)
			269 (1.6)	285 (0.9)	282 (1.2)	242 (2.7)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B4.2
Percentages and average quantitative proficiencies of older and younger adults, by reliance on various sources of information

SOURCE/ AGE			AMOUNT OF INFORMATION			
			A lot	Some	A little	None
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
Newspapers						
60 and older	3,693	39,383	53 (1.0)	27 (0.9)	11 (0.5)	9 (0.6)
			254 (2.2)	242 (2.5)	200 (6.5)	154 (6.6)
16 to 59	21,231	151,022	41 (0.6)	36 (0.5)	17 (0.4)	6 (0.2)
			292 (0.9)	282 (0.9)	269 (1.4)	222 (3.0)
Magazines						
60 and older	3,684	39,266	22 (0.9)	35 (0.9)	21 (0.8)	22 (0.9)
			249 (3.3)	258 (2.4)	238 (4.3)	186 (4.2)
16 to 59	21,220	150,914	17 (0.4)	41 (0.5)	29 (0.5)	13 (0.3)
			287 (1.6)	290 (0.9)	283 (1.2)	236 (1.8)
Radio						
60 and older	3,692	39,323	28 (1.0)	28 (0.8)	23 (0.8)	20 (1.0)
			226 (3.2)	246 (3.8)	248 (4.0)	222 (4.2)
16 to 59	21,217	150,940	38 (0.5)	35 (0.5)	21 (0.4)	6 (0.2)
			277 (1.0)	288 (0.9)	282 (1.3)	258 (2.8)
Television						
60 and older	3,695	39,374	74 (1.1)	19 (0.8)	5 (0.4)	2 (0.3)
			234 (2.1)	250 (3.8)	230 (10.0)!	172 (19.6)!
16 to 59	21,224	150,975	65 (0.6)	25 (0.5)	9 (0.3)	2 (0.2)
			274 (0.7)	295 (1.2)	288 (2.0)	286 (5.9)
Family members						
60 and older	3,686	39,288	20 (0.8)	40 (1.0)	28 (0.8)	13 (0.7)
			215 (3.9)	245 (3.1)	252 (3.2)	208 (5.8)
16 to 59	21,215	150,937	23 (0.4)	45 (0.5)	26 (0.4)	5 (0.2)
			270 (1.6)	287 (0.7)	286 (1.4)	247 (2.9)

n = sample size; WGT N = population size estimate /1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B4.3
Average literacy proficiencies of older and younger adults, by frequency of writing for personal use

TYPE OF WRITING/ LITERACY SCALE/ AGE			FREQUENCY		
			Often	Occasionally	Rarely
	n	WGT N (/1,000)	PROF (SE)	PROF (SE)	PROF (SE)
Letters: Prose					
60 and older	3,693	39,361	265 (2.1)	250 (2.7)	221 (2.3)
16 to 59	21,214	150,896	294 (0.9)	291 (1.6)	268 (0.8)
Reports: Prose					
60 and older	3,684	39,290	270 (5.0)!	263 (5.3)!	234 (1.7)
16 to 59	21,194	150,773	290 (1.4)	292 (1.7)	279 (0.7)
Forms					
Prose					
60 and older	3,690	39,326	261 (2.7)	261 (2.9)	225 (2.0)
16 to 59	21,208	150,839	296 (0.8)	293 (1.0)	265 (1.2)
Document					
60 and older	3,690	39,326	251 (2.4)	248 (3.1)	211 (2.1)
16 to 59	21,208	150,839	291 (0.9)	289 (1.0)	262 (1.2)
Quantitative					
60 and older	3,690	39,326	266 (3.0)	268 (3.4)	219 (2.8)
16 to 59	21,208	150,839	295 (0.9)	292 (1.1)	263 (1.1)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B4.4
Percentages and average quantitative proficiencies of older and younger adults, by frequency of personal arithmetic use

AGE			FREQUENCY		
			Often	Occasionally	Rarely
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
60 and older	3.674	39,148	65 (1.2) 257 (1.9)	10 (0.9) 229 (5.2)	25 (1.0) 181 (4.2)
16 to 59	21,209	150,918	82 (0.4) 290 (0.7)	8 (0.3) 260 (2.2)	10 (0.3) 220 (2.6)

n = sample size; WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B4.5

Average literacy proficiencies of older and younger adults, by frequency of writing at work

TYPE OF WRITING/ LITERACY SCALE/ AGE			FREQUENCY		
			Often	Occasionally	Rarely
	n	WGT N (/1,000)	PROF (SE)	PROF (SE)	PROF (SE)
Letters: Prose					
60 and older	1,389	12,991	279 (3.5)	258 (9.5)!	240 (3.9)
16 to 59	18,486	132,993	302 (0.8)	291 (2.4)	262 (1.2)
Reports Prose					
60 and older	1,388	12,989	280 (3.2)	277 (7.8)!	246 (3.3)
16 to 59	18,474	132,936	301 (1.1)	299 (2.2)	274 (0.9)
Forms					
Prose					
60 and older	1,389	12,991	274 (3.4)	277 (7.3)!	249 (3.2)
16 to 59	18,482	132,972	300 (0.9)	290 (1.8)	271 (1.0)
Document					
60 and older	1,389	12,991	258 (3.5)	258 (6.9)!	237 (3.3)
16 to 59	18,482	132,972	296 (0.9)	288 (1.6)	268 (1.2)
Quantitative					
60 and older	1,389	12,991	280 (4.1)	284 (6.9)!	253 (3.4)
16 to 59	18,482	132,972	301 (0.8)	291 (1.9)	270 (1.0)

n = sample size WGT N = population size estimate / 1,000. The sample sizes for subpopulations may not add up to the total sample sizes, due to missing data. PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Table B4.6
Percentages and average quantitative proficiencies of older and younger adults by frequency of arithmetic use at work

AGE			FREQUENCY		
			Often	Occasionally	Rarely
	n	WGT N (/1,000)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)	RPCT (SE) PROF (SE)
60 and older	1,390	12,952	74 (1.2) 278 (2.6)	5 (0.9) 279 (14.6)!	21 (1.2) 222 (6.9)
16 to 59	18,508	133,210	82 (0.4) 294 (0.7)	4 (0.2) 268 (3.5)	13 (0.4) 243 (2.1)

n = sample size; WGT N = Modulation size estimate / 1.000. The sample sizes for subpopulations mav not add up to the total sample sizes, due to missing data. RPCT = row percentage estimate; PROF = average proficiency estimate; (SE) = standard error of the estimate. The true population values can be said to be within 2 standard errors of the sample estimates with 95% certainty.

! Interpret with caution. The variability of this statistic cannot be determined accurately.

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

APPENDIX C

Overview of procedures

This appendix provides information about the methods and procedures used in the National Adult Literacy Survey. The forthcoming technical report will provide more extensive information about procedures. In addition, more detailed information on the development of the background questionnaires and literacy tasks can be found in *Assessing Literacy*.[1]

Sampling

The National and State Adult Literacy Surveys included the following three components: a national household sample, 11 individual state household samples, and a national prison sample. The national and state household components were based on a four-stage stratified area sample with the following stages: the selection of Primary Sampling Units (PSUs) consisting of counties or groups of counties, the selection of segments consisting of census blocks or groups of blocks, the selection of households, and the selection of age-eligible individuals. One national area sample was drawn for the national component; 11 independent, state-specific area samples were drawn for the 11 states participating in the state component (i.e., California, Illinois, Indiana, Iowa, Louisiana, New Jersey, New York, Ohio, Pennsylvania, Texas, Washington.) The sample designs used for all 12 samples were similar, except for two principal differences. In the national sample, Black and Hispanic respondents were sampled at a higher rate than the remainder of the population in order to increase their representation in the sample, whereas the state samples used no oversampling. Also, the target population for the national sample consisted of adults 16 years of age or older, whereas the target population for the state samples consisted of adults 16 to 64 years of age.

[1] A. Campbell, I. Kirsch, and A. Kolstad. (1992). *Assessing Literacy: The Framework for the National Adult Literacy Survey*. Washington, DC: Government Printing Office.

The sample designs for all 12 household samples involved four stages of selection, each at a successively finer level of geographic detail. The first stage of sampling involved the selection of PSUs, which consist of counties or groups of counties. The PSUs were stratified on the basis of region, metropolitan status, percent Black, percent Hispanic, and, whenever possible, per capita income. The national component used the WE STAT 100 PSU master sample with the Honolulu, Hawaii PSU added to the sample with certainty, to make 101 PSUs in total. The national frame of PSUs was used to construct individual state frames for the state component and a sample of eight to 12 PSUs was selected within each of the given states. All PSUs were selected with probability proportional to the PSU's 1990 population.

The second stage of sampling involved the selection of segments (within the selected PSUs) which consist of census blocks or groups of census blocks. The segments were selected with probability proportional to size where the measure of size for a segment was a function of the number of year-round housing units within the segment. The oversampling of Black and Hispanic respondents for the national component was carried out at the segment level, where segments were classified as high minority (segments with more than 25 percent Black or Hispanic population) or not high minority. The measure of size for high minority segments was defined as the number of White non-Hispanic households plus three times the number of Black or Hispanic households. High minority segments were therefore oversampled at up to three times the rate of comparable, non-high minority segments. The measure of size for nonminority segments was simply the number of year-round housing units within the segment, as was the measure of size for all segments in the state components. One in 7 of the national component segments was selected at random to be included in a "no incentive" sample. Respondents from the remaining segments in the national component received a monetary incentive for participation, as did respondents in the state component. (Respondents from the "no incentive" segments are not included in the household sample of this report.)

The third stage of sampling involved the selection of households within the selected segments. Westat field staff visited all selected segments and prepared lists of all housing units within the boundaries of each segment as determined by the 1990 census block maps. The lists were used to construct the sampling frame for households. Households were selected with equal probability within each segment, except for White non-Hispanic households in high minority segments in the national component, which were subsampled so that the sampling rates for White non-Hispanic respondents would be about the same overall.

The fourth stage of sampling involved the selection of one or two adults within each selected household. A list of age-eligible household members (16 and

older for the national component, 16 to 64 for the state component) was constructed for each selected household. One person was selected at random from households with fewer than four eligible members; two persons were selected from households with four or more eligible members. The interviewers, who were instructed to list the eligible household members in descending order by age, then identified one or two household members to interview, based on computer-generated sampling messages that were attached to each questionnaire in advance.

The sample design for the prison component involved two stages of selection. The first stage of sampling involved the selection of state or federal correctional facilities with probability proportional to size, where the measure of size for a given facility was equal to the inmate population. The second stage involved the selection of inmates within each selected facility. Inmates were selected with a probability inversely proportional to their facility's inmate population (up to a maximum of 22 interviews in a facility) so that the product of the first and second stage probabilities would be constant.

Weighting

Full sample and replicate weights were calculated for each record in order to facilitate the calculation of unbiased estimates and their standard errors. The full sample and replicate weights for the household components were calculated as the product of the base weight for a record and a compositing and raking factor. Demographic variables critical to the weighting were recoded and imputed, if necessary, prior to the calculation of base weights.

The base weight was calculated as the reciprocal of the final probability of selection for a respondent, which reflected all stages of sampling. The base weight was then multiplied by a compositing factor which combined the national and state component data in an optimal manner, considering the differences in sample design, sample size, and sampling error between the two components. Twelve different compositing factors were used, one for each of the 11 participating states, and a pseudo factor (equal to one) for all national component records from outside the 11 participating states. The product of the base weight and compositing factor for a given record was the composite weight.

The composite weights were raked so that several totals calculated with the resulting full sample weights would agree with the 1990 census totals, adjusted for undercount. The cells used for the raking were defined to the finest combination of age, education level, race, and ethnicity that the data would allow. Raking adjustment factors were calculated separately for each of the 11 states and then for the remainder of the United States. The above procedures were repeated

for 60 strategically constructed subsets of the sample to create a set of replicate weights to be used for variance estimation using the jackknife method. The replication scheme was designed to produce stable estimates of standard errors for national estimates as well as for the 11 individual states.

The full sample and replicate weights for the incarcerated component were calculated as the product of the base weight for a record and a nonresponse and raking factor. The base weight was calculated as the reciprocal of the final probability of selection for a respondent, which reflected both stages of sampling. The base weights were then nonresponse adjusted to reflect both facility and inmate nonresponse. The resulting nonresponse adjusted weights were then raked to agree with independent estimates for certain subgroups of the population.

Background Questionnaires

One of the primary goals of the National Adult Literacy Survey is to relate the literacy skills of the nation's adults to a variety of demographic characteristics and explanatory variables. Accordingly, survey respondents were asked to complete background questionnaires designed to gather information on their characteristics and experiences. To ensure standardized administration, the questionnaires were read to the respondent by trained interviewers.

As recommended by the Literacy Definition Committee, the development of the background questionnaire was guided by two goals: to ensure the usefulness of the data by addressing issues of concern, and to ensure comparability with the young adult and Department of Labor (DOL) job-seeker surveys by including some of the same questions. With these goals in mind, the background questionnaire addressed the following areas:

- general and language background
- educational background and experiences
- political and social participation
- labor force participation
- literacy activities and collaboration
- demographic information

Questions in the first category asked survey participants to provide information on their country of birth, their education before coming to the United States, language(s) spoken by others at home, language(s) spoken while growing up, language(s) spoken now, participation in English as a Second

Language courses, and self-evaluated proficiency in English and other languages. This information makes it possible to interpret the performance results in light of the increasing racial/ethnic and cultural diversity in the United States.

The questions on educational background and experiences asked respondents to provide information on the highest grade or level of education they had completed; their reasons for not completing high school; whether or not they had completed a high school equivalency program; their educational aspirations; the types and duration of training they had received in addition to traditional schooling; the school, home, or work contexts in which they learned various literacy skills; and any physical, mental, or health conditions they have that may affect their literacy skills. Information on respondents' education is particularly important because level of education is known to be a predictor of performance on the prose, document, and quantitative literacy scales.

The questions on political and social participation asked participants about the sources from which they get information, their television viewing practices, their use of library services, and whether or not they had voted in a recent election. Because an informed citizenry is essential to the democratic process, information was collected on how adults keep abreast of current events and public affairs. Information on adults' use of library services is also important, because libraries promote reading and often provide literacy programs. These questions make it possible to explore connections between adults' activities and their demonstrated literacy proficiencies.

The questions on labor force participation asked participants to provide information on their employment status, weekly wages or salary, weeks of employment in the past year, annual earnings, and the industry or occupation in which they work(ed). These questions respond to concerns that the literacy skills of our present and future work force are inadequate to compete in the global economy or to cope with our increasingly technological society. The questions were based on labor force concepts widely used in economic surveys and permit the exploration of a variety of labor market activity and experience variables.

Questions on literacy activities and collaboration covered several important areas. Some of the questions focused on the types of materials that adults read, such as newspapers, magazines, books, and brief documents, making it possible to investigate the relationship between reading practices and demonstrated literacy proficiencies. Another set of questions asked respondents about the frequency of particular reading, writing, and mathematics activities. Respondents were asked to provide information on their newspaper, magazine, and book reading practices; reading, writing, and mathematics activities engaged in for personal use and for work; and assistance received from others with particular literacy tasks.

Finally, the survey collected information on respondents' race/ethnicity, age, and gender, as well as the educational attainment of their parents, their marital status, the number of people in their family who were employed full-time and part-time, sources of income other than employment, and family and personal income from all sources. This demographic information enabled researchers to analyze the characteristics of the adult population, as well as to investigate the literacy proficiencies of major subpopulations of interest, such as racial/ethnic groups, males and females, and various age cohorts.

Because some questions included in the household survey were inappropriate for the prison population, a revised version of the background questionnaire was developed for these respondents. Most of the questions in the household background questionnaire on general and language background and on literacy activities and collaboration were included. Many questions concerning education, political and social participation, labor force participation, family income, and employment status were not appropriate, however, and were omitted. In their place, relevant questions were incorporated from the 1991 Survey of Inmates of State Correctional Facilities, sponsored by the Bureau of Justice Statistics of the U.S. Department of Justice.

Literacy Assessment Booklets

The National Adult Literacy Survey measures literacy along three scales — prose, document, and quantitative — composed of literacy tasks that simulate the types of demands that adults encounter in everyday life. The literacy tasks administered in this survey included 81 new tasks as well as 85 tasks that were included in the previous young adult and job-seeker surveys. The administration of a common pool of tasks in each of the three surveys allows for valid comparisons of results across time for different populations.

The new literacy tasks developed for the survey serve to refine and extend the three existing literacy scales and provide a better balance of tasks across the three scales. The framework used to develop these tasks reflects research on the processes and strategies that respondents used to perform the literacy tasks administered in the young adult survey. In creating the new tasks, one goal was to include diverse stimulus materials and to create questions and directives that represent the broad range of skills and processes inherent in the three domains of literacy. Another goal was to create tasks that reflect the kinds of reading, writing, and computational demands that adults encounter in work, community, and home settings. Because the tasks are meant to simulate real-life literacy activities, they are open-ended — that is, individuals must produce a written or

oral response, rather than simply choose the correct response from a list of options.

The new literacy tasks were developed with attention to the following elements:

- the structure of the stimulus material — for example, exposition, narrative, table, graph, map, or advertisement
- the content represented and/or the context from which the stimulus is drawn — for example, work, home, or community
- the nature of what the individual is asked to do with the material — that is, the purpose for using the material — which in turn guides the strategies needed to complete the task successfully

These factors, operating in various combinations, affect the difficulty of a task relative to others administered in the survey.

The printed and written materials selected for the survey reflect a variety of structures and formats. Most of the prose materials are expository — that is, they describe, define, or inform — since most of the prose that adults read is expository however, narratives and poetry are included as well. The prose selections include an array of linguistic structures, ranging from texts that are highly organized both topically and visually, to those that are loosely organized. Texts of varying lengths were chosen, ranging from full-page magazine selections to short newspaper articles. All prose materials included in the survey were reproduced in their original format.

The document materials represent a wide variety of structures, including tables, charts and graphs, forms, and maps. Tables include matrix documents in which information is arrayed in rows and columns (for example, bus or airplane schedules, lists, or tables of numbers). Documents categorized as charts and graphs include pie charts, bar graphs, and line graphs. Forms are documents that must be filled in, while other structures include advertisements and coupons.

Quantitative tasks require the reader to perform arithmetic operations using numbers that are embedded in print. Since there are no materials that are unique to quantitative tasks, they were based on prose materials and documents. Most quantitative tasks were, in fact, based on documents.

Adults do not read printed or written materials in a vacuum. Rather, they read within a particular context or for a particular purpose. Accordingly, the survey materials were chosen to represent a variety of contexts and contents. Six such areas were identified: home and family, health and safety, community and citizenship, consumer economics, work, and leisure and recreation. Efforts were

made to include as broad a range as possible and to select universally relevant contexts and contents to ensure that the materials would be familiar to all participants. In this way, the disadvantages for individuals with limited background knowledge were minimized.

After the materials were selected, accompanying tasks were developed. The tasks were designed to simulate the way in which people use various types of materials and to require different strategies for successful performance. For both the prose and document scales, the tasks can be organized into three major categories: locating, integrating, and generating information. In the *locating* tasks, readers were asked to match information given in a question or directive with either literal or synonymous information in the text or document. *Integrating* tasks asked the reader to incorporate two or more pieces of information from different parts of the text or document. *Generating* tasks required readers not only to process information located in different parts of the material, but also to draw on their knowledge about a subject or to make broad, text-based inferences.

Quantitative tasks required readers to perform one or more arithmetic operations (addition, subtraction, multiplication, or division) either singly or in combination. The type of operation to be performed was sometimes obvious from the wording of the question; in other tasks the readers had to infer which operation was to be performed. In some cases the numbers required to perform the operation could be easily identified; in others they were embedded in text. Some quantitative tasks asked the reader to explain how he or she would solve a problem, rather than to perform the actual calculation. The use of a simple, four-function calculator was required for some tasks.

Survey Design: BIB Spiralling

No individual could be expected to respond to the entire set of 166 simulation tasks administered as part of the survey. Accordingly, the survey design gave each respondent a subset of the total pool of literacy tasks, while at the same time ensuring that each of the 166 tasks was administered to a nationally representative sample of the adult population. Literacy tasks were assigned to blocks or sections that could be completed in about 15 minutes, and these blocks were then compiled into booklets so that each block appeared in each position (first, middle, and last) and each block was paired with every other block. Thirteen blocks of simulation tasks were assembled into 26 booklets, each of which could be completed in about 45 minutes. During a personal interview, each participant was asked to complete one booklet of literacy tasks and the background questionnaire, which required approximately 20 minutes.

For the national and state samples, 24 field supervisors, 24 field editors, and 421 field interviewers were recruited and trained in January and February of 1992. The 24 supervisors were trained first at a session in Bethesda, Maryland. The seven-day program included the interviewer training. Additionally, Westat provided training specific to supervisory responsibilities, including the use of Westat's Automated Survey Control System, a computer-based system for managing the data collection effort. Finally, supervisors and editors were trained to perform an item-by-item edit for each data collection instrument received from the field interviewers.

After the training offered in Bethesda, interviewers attended training sessions geographically closest to their homes, either San Francisco (January 31-February 2) or Dallas (February 7-9). Four training groups were formed at each of the two training sites. Each group was led by a Westat home office field manager. Within each of the four groups, the trainees were divided into "learning communities" with approximately 18 interviewers each. Each community was led by the field supervisor who would supervise the interviewers during the data collection phase.

The training program was modeled closely after Westat's general approach for training field staff. This approach uses a mix of techniques to present study material, focusing heavily on trainee participation and practice. The training program was standardized with verbatim scripts and a detailed agenda to ensure comparability in presentation across groups.

The key training topics were the data collection instruments — the household screener, the background questionnaire, and the interview guide and literacy exercise booklet. The majority of training time was devoted to instructions for administering these documents. In addition, sessions were used to present instructional material on gaining respondent cooperation, keeping records of nonresponse cases, editing completed work, and completing administrative forms. A bilingual field supervisor provided Spanish speaking interviewers with training on the Spanish translations of the screener and background questionnaires.

Prior to project-specific training, new interviewers attended an additional one-half day of training on general interviewing techniques. Interviewers selected to work on the prison sample received an additional day of training on interview procedures unique to that sample.

Administering the Data Collection Instruments

Data collection instruments included the screener, which was designed to enumerate household members and select survey respondents, the background questionnaire, and the literacy exercise booklets. Interviewers were given their first assignments and began work immediately after training. The interviewer was given a call record folder and screener for each sampled dwelling unit in his or her assignment. A computer-generated label attached to the front of each folder and screener provided the case identification number, address, and assigned exercise booklet number. Additionally, interviewers were provided with all other field materials necessary to conduct interviews and meet reporting requirements.

Case assignments were made by the field supervisors, who also mailed letters to households about one week before the interviewers planned to contact the household. When making contact, the interviewer first verified that the address was in the sample and the unit was, in fact, an occupied dwelling. If the unit did not meet the definition of a year-round housing unit or was vacant, or for some other reason the interviewer was unable to complete a screener at an assigned address, she or he documented the situation in a noninterview report form.

The interviewer introduced the study using an introduction printed on the front of the screener. As part of the introduction, the interviewer indicated that if someone from the household was selected for an interview, the respondent would be paid $20 for participating. After introducing the study, the interviewer proceeded to conduct the screening interview with any household member 16 years of age or older. If the household members spoke only a language other than Spanish or English, the interviewer could obtain the services of a translator to complete the screener interview.

The screener was used to collect names, relationships, sex, age and race/ethnicity of all household members at the selected dwelling unit. For the national sample, household members aged 16 years and older were eligible for selection. For the state sample, however, household members 16 to 64 years of age were eligible. In households with three or fewer eligible household members, one was randomly selected for the interview. In households with four or more eligibles, two respondents were selected. To select respondents, interviewers first listed the names and ages (in descending age order) of all eligible household members. They then referred to a sampling table which selected one or two respondents from the household.

Once the Screener was completed and a respondent(s) selected, the interviewer proceeded to administer the background questionnaire and the exercise booklet. If the selected respondent was not available at the time the

screener was conducted, the interviewer returned to administer the background questionnaire and exercise booklet, which were administered on the same visit.

The background questionnaire took approximately 20 minutes to administer and could be conducted in English or Spanish (using the Spanish printed version) only In the introduction to the background questionnaire, the respondent was told that he or she would be given a check for $20 in appreciation of the time and effort involved in completing the interview, questionnaires, and assessment. The background questionnaire was divided into six sections and collected demographic data as well as data on literacy-related behaviors. Respondents from each of the 11 participating states were asked five state-specific questions, which appeared at the end of the questionnaire.

When the background questionnaire was completed, the interviewer administered the exercise booklet, which took approximately 45 minutes. There were 26 different versions of the exercise booklet, and each version had a corresponding interview guide, which the interviewer used to facilitate the respondent's completion of tasks in the booklet.

For the prison population, the interviewer informed the selected inmate about the study using an introduction printed in the background questionnaire since there was no screener. As part of the introduction, the interviewer indicated that the inmate would receive a certificate of participation if he or she completed the survey. Because of varying prison regulations, it was not possible to pay inmates $20 for their participation and so they received the certificate. The background questionnaire and exercise booklet were administered using the same procedures as for the household population.

Response Rates

Since there were three instruments — screener, background questionnaire, and exercise booklet — required for the administration of the survey, it was possible for a household or respondent to refuse to participate at the time of the administration of any one of these instruments. Thus, response rates were calculated for each of the three instruments. For the prison sample there were only two points at which a respondent could refuse — at the administration of either the background questionnaire or exercise booklet. The response rates presented below reflect the percentage of those who had the opportunity to participate at each stage of the survey. The response rates for the national household and prison samples are as follows.

Instrument	Response Rates National	Prison
Screener	89.1%	N/A
Background Questionnaire	81.0%	85.7%
Exercise Booklet	95.8%	96.1%

Data Collection Quality Control

Several quality control procedures relating to data collection were used. These included the interviewer field edit, a complete edit of all documents by a trained field editor, validation of 10 percent of each interviewer's close-out work, and field observation of both supervisors and interviewers.

At the interviewer training session, interviewers were instructed on procedures for performing a field edit of all data collection documents. The main purpose of this edit was to catch and correct or explain any errors or omissions in recording, to learn from mistakes so they were not repeated, and to remove stray marks and completely fill in bubbles on the documents-that were to be optically scanned.

Additionally, a complete edit was performed on all documents by a trained field editor. An item-by-item review was performed on each document, and each error was fully documented on an edit form. The supervisor reviewed the results of the edit with the interviewer during his or her weekly telephone conference.

Validation is the quality control procedure used to verify that an interview was conducted and it took place at the correct address and according to specified procedures, or that nonresponse statuses (e.g., refusals, vacancies, language problems) were accurately reported by the interviewers. Interviewers knew that their work would be validated but did not know to what extent or which cases. A 10 percent subsample of dwelling units were selected and flagged in the supervisor's log and in the automated survey control system (ASCS). The supervisors performed validation interviews by telephone if a phone number was available. Otherwise, validation was performed in person by the supervisor or by another interviewer.

Field observations of both supervisors and interviewers were performed by Westat field management staff. One purpose of the interviewer observation was to provide home office staff with an opportunity to observe effectively both performance of field procedures and respondents' reactions to the survey. Another purpose was to provide feedback to weak interviewers when there was concern about their skills and/or performance. In addition to in-person observations, interviewers were required to tape record one complete interview

and assessment. The field supervisor selected the particular case in advance and listened to the tape to "observe" each interviewer.

Finally, nine of the 24 supervisors were visited by field management staff and evaluated on their editing, coding, office organization, ability to maintain up-to-date records on production data, and supervision of interviewers.

Scoring the Literacy Exercise Booklets

As the first shipments of exercise booklets were received at ETS, copies were made of actual responses to the tasks. These sample responses were then scored by various staff, including the test developer and scoring supervisor, using either the scoring guides developed for the young adult tasks or guides prepared during the development of the new tasks. As the sample responses were scored, adjustments were made to the scoring guides for the new tasks to reflect the kinds of answers that the respondents were providing.

The sample papers comprised the training sets used to train a group of readers who would score the exercise booklets. The purposes of the training were to familiarize the readers with the scoring guides and to ensure a high level of agreement among the readers. Each task and its scoring guide were explained and sample responses representative of the score points in the guide were discussed. The readers then scored and discussed an additional 10 to 30 responses. After group training had been completed, all the readers scored all the tasks in over a hundred booklets to give them practice in scoring actual booklets, as well as an opportunity to score more responses on a practice basis. A follow-up session was then held to discuss responses on which readers disagreed. The entire training process was completed in about four weeks.

Twenty percent of all the exercise booklets were subjected to a reader reliability check, which entailed a scoring by a second reader. To prevent the second reader from being influenced by the first reader's scores, the first reader masked the scores in every fifth booklet that he or she scored. These booklets were then passed on for a second reader to score. When the second reader had scored every item, the first reader's scores were unmasked. If there was a discrepancy between the two scores for any response, the scoring supervisor reviewed the response and discussed it with the readers involved.

The statistic used to report inter-reader reliability is the percentage of exact agreement — that is, the percentage of times the two readers agreed exactly in their scores. There was a high degree of reader reliability across all the tasks in the survey, ranging from a low of 88.1 percent to a high of 99.9 percent with an average agreement of 97 percent. For 133 out of 166 open-ended tasks, the agreement was above 95 percent,

The background questionnaire was designed to be read by a computerized scanning device. For most questions, field personnel filled in ovals next to the respondent's answers. Open-ended items in the background questionnaire were coded and the ovals filled in by ETS staff before they were shipped to the scanning department. Responses on the screener were transferred to scannable documents by ETS personnel when the check-in process was complete, and the screener documents were batched and sent to the scanning department on a regular basis. Exercise booklet scores were transferred to scannable documents by the readers who scored the items, and these were also batched and sent to the scanning department at regular intervals. The scanned data from screeners, background questionnaires, and exercise booklets were transmitted to magnetic tape, which was then sent to the ETS computer center. As each of the different instruments were processed, the data were transferred to a database on the main computer for editing.

Editing and Quality Control

Editing included an assessment of the internal logic and consistency of the data received. For example, data were examined for nonexistent housing locations or booklets, illogical or inconsistent responses, and multiple responses. Where indicated, an error listing was generated and sent back to the processing area, where the original document was retrieved and the discrepancies were corrected. If resolution of a conflict in the data was not possible, the information was left in the form in which it was received. Wherever possible, however, conflicts were resolved. For example, in the infrequent cases in which field personnel provided more than one response to a single-response noncognitive item, specific guidelines were developed to incorporate these responses consistently and accurately. The background questionnaires were also checked to make sure that the skip patterns had been followed and all data errors were resolved. In addition, a random set of booklets was selected to provide an additional check on the accuracy of transferring information from booklets and answer sheets to the database.

Scaling

The results from the National Adult Literacy Survey are reported on three scales established by the NAEP 1985 Young Adult Literacy Survey prose literacy, document literacy, and quantitative literacy. With scaling methods, the

performance of a sample of examinees can be summarized on a series of subscales even when different respondents have been administered different items. Conventional scoring methods are not suited for assessments like the national survey. Statistics based on the number of correct responses, such as proportion of correct responses, are inappropriate for examinees who receive different sets of items. Moreover, item-by-item reporting ignores similarities of subgroup comparisons that are common across items. Finally using average percent correct to estimate means of proficiencies of examinees within subpopulations does not provide any other information about the distribution of skills among the examinees.

The limitations of conventional scoring methods can be overcome by the use of item response theory (IRT) scaling. When several items require similar skills, the response patterns should have some uniformity. Such uniformity can be used to characterize both examinees and items in terms of a common scale attached to the skills, even when all examinees do not take identical sets of items. Comparisons of items and examinees can then be made in reference to a scale, rather than to percent correct. IRT scaling also allows distributions of groups of examinees to be compared.

Scaling was carried out separately for each of the three domains of literacy (prose, document, and quantitative). The NAEP reading scale, used in the young adult survey, was dropped because of its lack of relevance to the current NAEP reading scale. The scaling model used for the national survey is the three-parameter logistic (3PL) model from item response theory.[2] It is a mathematical model for estimating the probability that a particular person will respond correctly to a particular item from a single domain of items. This probability is given as a function of a parameter characterizing the proficiency of that person, and three parameters characterizing the properties of that item.

Overview of Linking the National Adult Literacy Survey (NALS) Scales to the Young Adult Literacy Survey (YALS) Scales

Prose, document, and quantitative literacy results for the National Adult Literacy Survey are reported on scales that were established in the Young Adult Literacy Survey. For each scale, a number of new items unique to the national survey were added to the item pool that was administered in the original young adult survey. The NALS scales are linked to the YALS scales based upon the commonality of the two assessments, namely, the original young adult survey

[2] A. Birnbaum. (1968). "Some Latent Trait Models." In F. M. Lord and M. R. Novick, *Statistical Theories of Mental Test Scores*. Reading, MA: Addison-Wesley. F. M. Lord. (1980). *Applications of Item Response Theory to Practical Testing Problems*. Hillsdale, NJ: Erlbaum.

common items. Fifty-one percent of the items administered in the national survey were common to young adult survey. The composition of the item pool is presented in table C.1.

A unidimensional IRT model like the three-parameter logistic model employed in this study assumes that performance on all the items in a domain can, for the most part, be accounted for by a single (unobservable) proficiency variable. Subsequent IRT linking and scaling analyses treat each scale separately, that is, a unique proficiency is assumed for each scale. As a result, the linking of corresponding scales was carried out for each pair of scales separately. The three steps used to link the scales are listed below.

1. Establish provisional IRT scales through common item parameter calibration based on a pooling of the NALS and YALS items.
2. Estimate distribution of proficiencies on the provisional IRT scales using "plausible value" methodology.
3. Align the NALS scale to the YALS scale by a linear transformation based upon the commonality of proficiency distribution of the YALS sample.

NALS

Table C.1

Composition of the Item Pool for the National Adult Literacy Survey

SCALE	Number of Items: YALS items	New items	NALS total
Prose	14	27	41
Document	56	25	81
Quantitative	15	28	43
Total	85	81	165

Source: U.S. Department of Education, National Center for Education Statistics, National Adult Literacy Survey, 1992.

Statistical Procedures

The statistical comparisons in this report were based on the t statistic. Generally, whether or not a difference is considered significant is determined by calculating a t value for the difference between a pair of means, or proportions, and comparing this value to published tables of values at certain

critical levels, called *alpha levels*. The alpha level is an a priori statement of the probability of inferring that a difference exists when, in fact, it does not.

In order to make proper inferences and interpretations from the statistics, several points must be kept in mind. First, comparisons resulting in large t statistics may appear to merit special note. This is not always the case, because the size of the t statistic depends not only on the observed differences in means or the percentage being compared, but also on the standard error of the difference. Thus, a small difference between two groups with a much smaller standard error could result in a large t statistic, but this small difference is not necessarily noteworthy. Second, when multiple statistical comparisons are made on the same data, it becomes increasingly likely that an indication of a population difference is erroneous. Even when there is no difference in the population, at an alpha level of .05, there is still a 5 percent chance of concluding that an observed t value representing one comparison in the sample is large enough to be statistically significant. As the number of comparisons increases, the risk of making such an error in inference also increases.

To guard against errors of inference based upon multiple comparisons, the Bonferroni procedure to correct significance-tests for multiple contrasts was used. This method corrects the significance (or alpha) level for the total number of contrasts made with a particular classification variable. For each classification variable, there are (K°(K-1)/2) possible contrasts (or nonredundant pairwise comparisons), where K is the number of categories. The Bonferroni procedure divides the alpha level for a single t test (for example, .05) by the number of possible pairwise comparisons in order to give a new alpha that is corrected for the fact that multiple contrasts are being made.

The formula used to compute the t statistic is as follows:

$$t = \frac{P_1 - P_2}{\sqrt{se_1^2 + se_2^2}}$$

where P_1 and P_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors.

APPENDIX D

Definitions of Subpopulations and variables

Older adult population

Survey respondents were asked to report their date of birth, and this information was used to calculate their age. The older adult population includes individuals age 60 and older. (The rationale for using 60, rather than 65, as the lower boundary is explained at the beginning of Chapter 1.) In some parts of the report, results are presented for three age groups of older adults: age 60 to 69; 70 to 79; and 80 and older.

Younger adult population

The younger adult population includes individuals age 16 through 59. In some parts of the report, data are presented for two age groups within this population: age 16 to 24 and age 25 to 59.

Self-reported literacy proficiencies

Survey participants were asked how well they understand English when it is spoken to them, and how well they speak it, read it, write it, and do arithmetic. The response options were: very well, well, not well, and not at all. The last two options (not well, not at all) were collapsed into one category for reporting purposes.

Help with literacy

Respondents were asked how much help they get from family members or friends with everyday literacy tasks: filling out forms, reading newspaper articles or other written information, reading printed information associated with government agencies, companies, etc., writing letters, and using basic arithmetic. Four response options were given: a lot, some, a little, and none.

Level of education

Respondents were asked to indicate the highest level of education they completed in this country. The following options were given:

- Still in high school
- Less than high school
- Some high school
- GED or high school equivalency
- High school graduate
- Vocational, trade, or business school after high school
- College: less than 2 years
- College: associate's degree (A.A.)
- College: 2 or more years, no degree
- College graduate (B.S. or B. A.)
- Postgraduate, no degree
- Postgraduate degree (M. S., M. A., Ph. D., M. D., etc.)

These options were collapsed as follows: "less than high school" and "some high school" were collapsed into a new category, "0 to 12 years"; the GED and high school graduate categories were combined; and the remaining groups were combined into the category "some postsecondary." The category "still in high school" is omitted from the analyses, as no comparisons between the under-60 and older adult populations can be made for adults with this level of education.

Reason for leaving school

Respondents who reported that their highest level of education was less than high school, some high school, or a GED were asked to indicate their main reason for dropping out of school. They were asked to choose from the following reasons:

- financial problems
- went to work or into the military
- pregnancy
- lost interest or behavior problems in school
- academic problems in school
- family or personal problems
- other

Race/ethnicity

Respondents were asked two questions about their race and ethnicity. The first question asked them to indicate which of the following best described them:

- White
- Black (African American)
- American Indian
- Alaskan Native
- Pacific Islander
- Asian
- Other

The interviewer recorded from observation the races of respondents who refused to answer the question. The second question asked respondents whether they were of Spanish or Hispanic origin or descent. Those who responded "yes" were asked to identify which of the following groups best describes their Hispanic origin:

- Mexicano, Mexican, Mexican American, Chicano
- Puerto Rican
- Cuban
- Central/South American
- Other Spanish/Hispanic

In most cases, data are reported for three groups: White, Black, and Hispanic. These categories are mutually exclusive. All those who indicated they were of Spanish or Hispanic origin are classified as Hispanic, regardless of their origin. Data for older adults who indicated they were Pacific Islander, Asian, American Indian, and Alaskan Native are not reported because of their small numbers in the sample. For analyses in which the sample sizes were too small to permit further disaggregation, data are reported for two racial/ethnic groups: White and Other.

Language usually spoken

This variable was derived from multiple survey questions. Respondents were asked what languages they learned before starting school. Those who reported having learned only English were categorized as usually speaking English now. Those who reported that they learned another language before starting school were asked what language they usually speak now. Respondents who indicated that they usually speak English were grouped with those who learned only English. Two other categories were also established: English and other, and other only.

Language learned before starting school

Respondents were asked what language or languages they learned to speak before starting school. Respondents are divided into three categories: English only, English and other, and other only.

Visual impairment

Respondents were asked whether they have difficulty seeing the words or letters in ordinary newspaper print even when wearing glasses or contact lenses (if they usually wear them). Those who responded "yes" are classified as having a visual impairment.

Sex

The interviewers recorded the sex of each respondent.

Region

Census definitions of regions are used in reporting the results. The four regions are the Northeast, South, Midwest, and West. The states in each region are identified below.

- Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania
- South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas
- Midwest: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
- West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, Hawaii

Labor force participation

Respondents were asked what they were doing the week before the survey:

- working at a full-time job for pay or profit (35 hours or more)
- working two or more pm-t-time jobs for pay, totaling 35 or more hours
- working for pay or profit part-time (1 to 34 hours)
- unemployed, laid off, or looking for work
- with a job but not at work (e.g., illness, vacation, or work stoppage)
- with a job but on family leave (maternity or paternity leave)
- in school
- keeping house
- retired
- doing volunteer work

Five categories were established: employed; unemployed, laid off, or looking for work; out of the labor force; retired; and retired and volunteering. Adults in the first three categories were considered as being employed; those in the fourth category were counted as unemployed; those in the seventh and eighth categories as being out of the labor force; those in-the ninth category *only* as retired; and those in both the ninth and tenth categories as retired and volunteering. (Results for adults in the fifth and sixth categories are not reported here.)

Volunteer activity

From the question on labor force participation (described above), a variable was derived relating to volunteer activity. Two groups were established: those who volunteered the week before the survey, and those who did not.

Voting

The survey asked respondents whether they had voted in a national or state election in the past five years. Some participants reported being ineligible to vote, and they were excluded from the analyses. The results reported reflect the percentages of eligible adults who voted.

Annual household income

Respondents were asked to indicate their total family income from all sources in 1991. They were instructed to consider as family anyone who lived in their household and who was related to them by blood, marriage, or adoption. Responses were aggregated into the following categories:

- Less than $10,000
- $10,000 to $19,999
- $20,000 to $39,999
- $40,000 or more

In some cases, household income is reported using three categories: Less than $10,000; $10,000 to $19,999; and $20,000 or more. In other cases, two categories are used: Less than $20,000, and $20,000 or more.

Acquisition of literacy skills

All participants were asked where they primarily learned to read newspapers, magazines, or books; to read graphs, diagrams, or maps; to fill out forms; and to write letters, notes, memos, or reports. The response-choices were: mostly in school, at home or in the community, at work, did not learn. and other.

Library use

Respondents were asked how often they use the services of a library for any reason. The options were: daily, weekly, monthly, once or twice a year, and never.

Newspaper reading

Respondents were asked how often they read a newspaper in English: every day, a few times a week, once a week, less than once a week, or never. The options of every day and a few times a week were collapsed into one category. The other categories were reported as collected.

Magazine reading

Respondents were asked how many different magazines they look at or read in English on a regular basis. The response options were: 0, 1, 2, 3 to 5, and 6 or more. These were collapsed into three reporting categories: none, 1 or 2, and 3 or more.

Sources of information about current events

Respondents were asked how much information about current events, public affairs, and the government they usuallv get from newspapers, magazines, radio, television, and familv members. The response options were: a lot, some, a little, and none.

Television viewing

Respondents were asked how many hours of television they watch each day none, 1 hour or less, 2 hours, 3 hours, 4 hours, 5 hours, or 6 hours or more. These options were collapsed into 3 categories: O to 1 hour, 2 to 3 hours, and 4 or more hours.

Personal literacy activities

Respondents were asked how often they read the following materials for personal use: letters or memos; reports, articles, magazines, or journals; manuals or reference books, including catalogs and parts lists; directions or instructions for medicines, recipes, or other products; diagrams or schematics; bills, invoices, spreadsheets, or budget tables. They were also asked how often they write letters or memos; fill out forms; and use arithmetic.

The response options were: every day, a few times a week, once a week, less than once a week, and never. These were collapsed into three categories: often (every day or a few times a week), occasionally (once a week), and rarely (less than once a week or never).

Work-related literacy activities

Respondents who had held a paying job within the past three years were asked how often they engage(d) in various literacy activities at work. The list of activities and response options used in these questions were the same as those used for the questions about personal literacy activities (see above).

APPENDIX E

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