The Changing Character of Literacy

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Thomas Jefferson believed that education in a republic served three important functions: ‘‘. . . to prepare some citizens to be public leaders, to enable all citizens to exercise the common rights of self-government, and to ready all citizens for the pursuit of happiness in the society’s private sphere. The skills required for citizenship and individual development were different in Jefferson’s time than they are today or than they will be 10 or 20 years from now. ‘‘The main literacy problem, over the long run, has not been that people’s literacy skills have been slipping, but that literacy demands keep rising. ’ ‘[2] Understanding what it means to be literate in American society today is an important part of the overall literacy challenge.

There are many different definitions of literacy, some broad and inclusive, others more narrow. For this report, the Office of Technology Assessment (OTA) adopts the definition of literacy that appears in the National Literacy Act of 1991: “. . . 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 develop one’s knowledge and potential.”[3] As this definition suggests, being literate today means more than just being able to read. Similarly, this definition suggests that literacy is relative and will be defined differently for different people; thus, no score on a test can adequately describe any individual’s ‘‘level” of

[1] Robert D. Heslep, *Thomas Jefferson and Education (New* York, NY: Random House, 1%9), p. 88.

[2] Richard L. Venezky et al., *The Subtle Danger: Reflections on the Literacy Abilities of America’s Young Adults* (Princeton, NJ: Educational Testing Service, January 1987), p. 5.

[3] Public Law 102-73, sec. 3, National Literacy Act of 1991.

literacy. OTA considers inappropriate those definitions of literacy that specify thresholds above which one is literate. However, tests and other assessment tools can serve as proxies for estimating literacy in specific areas such as reading, writing, or mathematics when measurement of an individual's progress over time or the effectiveness of literacy programs is needed.

FINDINGS

- Changes occurring in society today are raising questions about the skills and knowledge essential to the education of all Americans. Along with the traditional components of literacy, citizens may need higher order thinking and problem-solving skills, computer and other technology-related skills, literacy skills necessary for the workplace, and literacy skills appropriate for family life.

  The Nation faces a sizable literacy challenge: a very large portion of the U.S. population is in need of improving their literacy skills. While numbers are difficult to fix, as many as 20 to 30 percent of the adult population (35 to 50 million people) have difficulties with common literacy tasks such as following written directions or locating and using information contained in documents, maps, and tables. Although many of these adults can read at rudimentary levels, they need higher levels of reading, writing, and mathematical proficiency to function effectively in society.
- The literacy needs of this large group are very diverse. Literacy services need to be targeted to meet specific needs. There are at least three segments of the adult population whose numbers are large enough to merit special attention in policy and educational planning: those who lack high school diplomas, those whose native language is not English, and those seeking jobs or better employment. Given their large numbers, these groups may be efficiently served by new approaches and improved use of technology.
- Each year immigrants, high school dropouts, displaced workers, and others swell the already large numbers of those in the "literacy pool" who need improved skills. OTA estimates that somewhere between 1.0 and 2.3 million adults are currently added to this pool annually.
- Educational programs serving adults who) are parents are likely to have two important outcomes: improving the skills and the life outcomes for the adult, and increasing the chances of school success for that adult's children. Special benefits are, therefore, likely when parents, especially mothers, are assisted by literacy programs.
- Dramatic demographic trends are changing the composition of the U.S. population, and the numbers of adults with literacy needs may grow even larger in the future. A challenge for policymakers is to develop long-range plans that anticipate the literacy needs of tomorrow while addressing an already large and difficult problem today.
- Just as the definition of literacy has expanded to include both workplace and family contexts, so too must the delivery system move beyond a school-based, institutional model to reach people in the workplace and help them learn while on the job, and to reach people in their homes and help them learn in new ways.

WHAT IS LITERACY?

Frequently cited estimates of the population of "fictionally illiterate" adults in the United States range anywhere from 1 to 80 million.[4] Most of the discrepancies in the estimates can be explained by examining which definition of ''literacy' is chosen and which measurement tool is used to represent that definition. Depending on the definition, the problem can appear big or small. And even if a seemingly straightforward

[4] U.S. Department of Education, Adult Leaning and Literacy Clearinghouse, "Adult Illiteracy in the U.S.: A Little or a Lot?" unpublished document, n.d.; and Margaret Genovese, ''Ill Feelings About Measuring Illiteracy," *Presstime*, September 1986, pp. 18-19.

Library of Congress

Naturalization class for immigrants in the early 1900s. Throughout this century the skills required to participate fully in society have become more complex. The task of helping new immigrants acquire these skills has also changed dramatically.

definition is chosen—for example, ability to read-the estimates of how many people can read will vary depending on whether the researcher asks people *if they can read, asks* them *how much school they* have completed, or gives them *a reading test.*

> People often think of literacy as a hierarchical, measurable skill, but recent work by linguists and anthropologists suggests otherwise. Literacy is elusive, complex. Its study requires careful definitions.[5]

Public sense of what literacy is has changed dramatically over time. Early in this century the proxy for literacy was the ability to write one's name; by this historical indicator, most adults living in the United States today would be considered literate. Throughout this century the skills required for citizenship and individual development have become more complex and the expectations for what constitutes literacy have risen. On many measures-including years of schooling or acquisition of basic reading skill—literacy in America has improved. However, despite this improvement, more is needed to meet the demands of a technological society. Furthermore, experts contend that any ''standard' for literacy-be it the equivalent of a high school education or a certificate of vocational competence-will need to be continually raised and

[5] Lawrence C. Stedman and Carl F. Kaestle, "Literacy and Reading Performance e in the United States From 1880 to the Present,' ***Literacy in the United States, Cad*** F. Kaestle et al. (eds.) (New Haven, C'I': Yale University Press, 1991), p. 77.

changed as the rate of technological innovation continues to accelerate.

Defining Basic Skills

The question of which skills are necessary for literacy becomes even more complicated if one tries to anticipate what skills might be required in 10 or 20 years. For many years, the notion of literacy usually meant reading; literacy proficiency was determined by a person's grade-level reading ability. Over time that notion has expanded to include reading, writing, and arithmetic.

Most models of elementary and secondary education are built on the assumption that these "basic" skills are developed in a sequential, hierarchical manner and can be associated with established grade-level equivalents.[6] Similarly, most adult literacy programs assume that adult education should replicate the school grades and eventually lead to the set of skills expected of a high school graduate;[7] these skills are understood to be useful for all adults and in a wide variety of settings.

During the 1970s, a number of literacy providers began to expand the notion of literacy to include "functional competencies" or "life skills" that all adults should have. This approach was first popularized by the Adult Performance Level Project, which focused on identifying the "... competencies which are functional to economic and educational success in today's society. ' Their model of functional competency expanded the requisite academic skills to include problem solving, speaking, and listening. In addition, these investigators conceived of competence partly in terms of knowledge areas (e.g., consumer economics and occupational knowledge) and thus focused on information that adults need to know, in addition to skills they need to have (see box 2-A).[9]

This competency-oriented approach has continued to gain acceptance. It emphasizes learning as "... the ability to perform specific literacy-related tasks in the context of work, family and other 'real-life' situations. "[10] Since these tasks are different for every adult, this orientation leads to a more individualized set of 'requisite skills."

Today most literacy programs teach some combination of academic basics and life skills. The approach chosen reflects a larger set of beliefs about the ends that adult literacy education should serve. "The goal of academically-oriented programs is to develop general abilities that presumably can be applied across situations depending on the goals of the learner. In contrast, competency-oriented instruction is intended to help learners handle specific tasks in their immediate life situation."[11]

One important issue in this debate is that of generalizability-some argue that focusing on a specific set of skills may not prepare learners to cope with new tasks or changing literacy demands.[12] Some educators further argue that literacy programs need to provide learners with a general set of skills that will allow them to gather and use information and continue learning through-

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C Elizabeth Hayes, University of Wisconsin- Madison, "Beyond Skills Versus Competencies: Issues and Strategies in the Evaluation of Adult Literacy Instructional Programs," unpublished manuscript, March 1992.

7 Thomas G. Sticht, Applied Behavioral and Cognitive Sciences, Inc., ''Testing and Assessment in Adult Basic Education and English as a Second Language Programs,'' unpublished manuscript, January 1990.

8 Norvell Northcutt, The University of Texas at Austin, ''Adldt Functional Competency: A Summary, " unpublished manuscript, March 1975, p. 1.

9 Stedman and Kaestle, op. cit., footnote 5.

10 Hayes, op. cit., footnote 6, p. 1.

11 Ibid., p. 4.

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out their lifetimes-to become "competent novices." For example, in the workplace:

> . . . being a competent novice means learning how to manage oneself effectively in a novel situation by noticing procedures and social interactions, copying experts, asking for explanations and guidance, getting a mentor, and taking extra time . . . to study the layout, devices, tools, and other artifacts . . . that make up the work setting.[13]

Beyond the Basics: Changing Views of Essential Skills

Changes occurring in society today, as well as projected future trends, suggest that any definition of what it means to be literate will need to change. Elementary- and secondary-level educators have begun to reexamine and redefine the skills and knowledge considered essential to the education of all Americans. Many of today's adults do not have these skills and knowledge. Technological advances will continue to change the ways people communicate with one another, shop, interact with social institutions, get information, and do their jobs. Projections about the changing nature of work suggest that a somewhat different profile of skills may be needed by high school graduates entering the workforce in the future. Changing economic and technological forces will continue to create displaced workers who need to relearn basic skills, upgrade those skills, or learn new skills, These trends suggest that adults cannot rely on a limited period of formal schooling during youth to carry them through the next 50 to 70 years of life.

There are many competing ideas about which new skills are the most important ones people need, but little empirical evidence exists to support any particular viewpoint. Throughout the education community today, there are many lively and productive debates going on about new goals, new skills, and new visions of what schooling should provide to all Americans. Similarly, there are many competing visions of what additional skills deserve room on the "literacy plate." Several of these new efforts are discussed below.

Portable Skills: Literacy as Problem Solving

Research in cognitive science suggests ways of understanding the underlying information-processing and problem-solving skills common to a wide variety of reading, writing, computational, and communication tasks.[14]

> The cognitive science conception of literacy orients us to think about literacy as a tool for knowledge construction, a tool for learning. This view of literacy takes us beyond routine acts of decoding or calculation, and even beyond fairly complex acts of filling out bureaucratic forms or following job instructions, . . . The goal is to educate a citizenry who are able to use print to learn, in new and changing environments. Citizens must learn how to learn from texts, rather than merely interpret them and memorize facts. They must be able to critically evaluate what they read, to express themselves clearly and cogently in written and oral form, and to use various forms of computer technology as tools for learning. Within cognitive science, literacy has been reconceptualized as reasoning or problem solving in order to generate new knowledge.[15]

Although this work is still under development, its most prominent application is the National Assessment of Educational Progress (NAEP) Literacy Assessment, which has grouped literacy skills into three areas-prose, document, and quantitative-each thought to represent distinct and important aspects of literacy. The NAEP

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13 Senta A. Raizen, *Reforming Education for Work: A Cognitive Science Perspective* (Berkeley, CA: National Center for Research in Vocational Education, December 1989), p. 61.

14 Hayes, op. cit., footnote 6.

15 Sarah Michaels and Mary Catherine O'Connor, "Literacy as Reasoning Within Multiple Discourses: Implications for Policy and Educational Reform," paper presented at the Council of Chief State School Officers 1990 Summer Institute, Newton, MA, p. 5.

Box 2-A—Life Skills and Competencies: Two Examples

Adult Performance Level Project: Competencies

Funded by the U.S. Office of Education in 1971, the Adult Perfomance Level (APL) project was designed to define "fictional competency." The original goal of the project was to: "0. . foster through every means the ability to read, write and compute with the functional competence needed for meeting the requirements of adult living.' [1] In order to establish a comprehensive basis for defining important skills, the APL study held conferences on adults' needs, surveyed Federal, State, and foundation officials as to what should be taught in adult education classes, conducted a literature review, and interviewed undereducated adults.

This process generated a two-dimensional definition of functional competence ".. . best described as the application of a set of skills to a set of general knowledge areas. . . which result from the requirements imposed upon members of a society. "2 Five general knowledge areas were identified: consumer economics, occupational knowledge, community resources, government and law, and health. In addition, four primary skills were identified that". . . seemed to account for the vast majority of requirements placed on adults. The four skills were called communication skills (reading, writing, speaking, and listening), computation skills, problem-solving skills, and interpersonal relations skills.

1 Anabel Powell Newman and Caroline Beverstock, *Adult* Literacy: *Contexts and Challenges* (Newark, DE: International Reading Association, 1990), p. 68.

2 Norvell Northcutt, The University of Texas at Austin, "Adult Functional Competency: A Summary," unpublished manuscript, March 1975, p. 2.

3 Ibid., p. 2.

study is attempting to identify the information-processing skills that underlie competent performance in each area and develop ways to teach those skills.[16]

Technology Skills

New technologies, especially those that are computer-based, are viewed as increasingly important tools. Most recent high school graduates have some experience with computers. In addition to being used in schools as instructional aids, computers provide students with valuable skills for the labor market and other aspects of their lives. As early as 1983, the National Commission on Excellence in Education saw the need for all students to receive instruction in the use of computers as part of a basic high school education, along with English, mathematics, science, and social studies. Their report, *A Nation at Risk*, recommended that high schools equip graduates to:

> (a) understand the computer as an information, computation, and communication device; (b) use the computer in the study of the other Basics and for personal and work-related purposes; and (c) understand the world of computers, electronics, and related technologies. 17

Similarly, the most recent revision (1991) of the Comprehensive Adult Student Assessment System (CASAS) competencies used in adult

16 Irwin Kirsch et al., *Beyond the School Doors: The Literacy Needs of Job Seekers Served by the U.S. Department of Labor*, prepared for the U.S. Department of Labor (Princeton, NJ: Educational Testing Service, September 1992).

17 U.S. Department of Education, National Commission on Excellence, A *Nation at Risk* (Washington, DC: U.S. Government Printing Office, April 1983), p. 26,

CASAS Competency List

A recent attempt to define the range of possible competencies for adult basic education efforts is the Comprehensive Adult Student Assessment System (CASAS). CASAS is based on a competency list that has been drawn up by adult basic education programs throughout California and other States; these Skills represent the". . . basic and life skills necessary for an adult to function proficiently in society."[4] To be included on the list, a competency must be rated as appropriate and relevant by at least 80 percent of the participating consortium agencies. (CASAS then allows programs to tailor their curriculum and their assessment to the populations they serve by selecting relevant competencies from the list.) Each year the participating organizations meet to revise and update the competency list. The list that follows gives examples of competencies that have been identified within seven content areas.[5]

1. Consumer Economics-includes skills such as:
   - uses weights, measures, measurement scales, and money;
   - understands methods and procedures to obtain housing and services; and
   - uses banking and financial services in the community.
2. Community Resources-includes skills such as:
   - understands how to locate and use different types of transportation and interpret related travel information;
   - uses the services provided by the Post Office; and
   - uses published or broadcast information.
3. Health-includes skills such as:
   - understands common ailments and seeks appropriate medical assistance;
   - understands medical and dental forms and related information; and
   - understands basic health and safety procedures.
4. Occupational Knowledge-includes skills such as:
   - understands basic principles of *getting* a job;
   - understands wages, benefits, and concepts of employee organizations; and
   - understands materials and concepts related to job training, employment, keeping a job, and *getting* a promotion.
5. Government and Law-includes skills such as:
   - understands voting and political process;
   - understands historical information; and
   - understands the concepts of taxation.
6. Computation-includes skills such as:
   - uses measurement;
   - interprets data from graphs or computes averages; and
   - uses estimation and mental arithmetic.
7. Domestic Skills-includes skills such as:
   - performs self-care @S; and
   - perform home-care skills.

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4 Comprehensive Adult Student Assessment System, *CASAS Statewide Accountability* System for *Federally Funded* 321 *Adult Basic Education Programs, Executive Summary* (San Diego, CA: 1991), p. L

5 Comprehensive Adult Student Assessment System, *CASAS Competency List* (San Diego, CA: 1992); and Comprehensive Adult student Assessment System, *ABE 321 Test Administrators Manual* (San Diego, CA: 1991).

basic education programs added the following new skills to their competency list:

- Interpret operating instructions and directions for use of a computer,
- Read or interpret computer generated printouts, and
- Demonstrate use of business machines such as cash registers and calculators.[18]

Although directly educating people about computers is important, researchers have stressed that reading, comprehension, and reasoning skills are fundamental for computer use. One survey of small businesses found that employers feel they can train workers in computer-related skills relatively quickly if those workers have good general educational skills with reasoning and communication proficiencies.[19] While confirming the place of computer competence in a secondary school curriculum, *A Nation at Risk* recommended a brief period of computer education (1/2 year) compared with subjects such as English (4 years), mathematics (3 years), social studies (3 years), and science (3 years). Available data suggest that long periods of training in computer use are not necessary for most jobs. The National Commission for Employment Policy has predicted that as of 1995 only about 1 percent of all workers will have jobs that require long-term training in computer use, while about 23 percent of the labor force will have jobs with computer-related demands that require a minimal amount of training.[20]

These trends suggest that it will be increasingly important for adult education efforts to offer learners opportunities to use computers, gain familiarity with them as personal tools, and understand their role in society as communication and information devices. Since the software and hardware are constantly changing, these efforts will probably be most effective if they give students an underlying set of "user skills" that will enable them to understand and use new technologies, rather than train students in any specific software or application. Further research is needed to identify which cognitive skills underlie effective use of technology.

Literacy Skills for the Workplace

In recent years, a growing number of policy reports have suggested that workers will need new skills to perform jobs in the workplace of the future. Many of these reports have attempted to list the skills necessary for productive, entry-level workers. The most recent report of the Secretary Commission on Achieving Necessary Skills (SCANS) proposed a three-part foundation of skills and personal qualities, as well as five competencies that ''. . . lie at the heart of job performance. . . . These eight requirements are essential preparation for all students, both those going directly to work and those planning future education. '[21] The three foundation skill areas are:

Basic skills—reading, writing, arithmetic: and mathematics, speaking, and listening;

- *Thinking skills—be* able to learn, reason, think creatively, make decisions, and solve problems; and
- *Personal* qualities—individual responsibility, self-esteem and self-management, sociability, and integrity.

The five workplace competencies that workers should productively use are:

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18 Comprehensive Adult Student Assessment System, *CASAS* Competency *List* (San Diego, CA:1991), p. 10.

19 Henry M. Levin and Russell W. Rumberger, ''Education and Training Needs for Using Computers in Small Businesses, " ***Educational Evaluation and Policy Analysis,*** vol. 8, No. 4, winter **1986,** pp. 423-434.

20 See ibid.

21 U.S. Department of Labor, The Secretary's Commission on Achieving Necessary Skills, ***What Work Requires of Schools: A SCANS Report for America 2000*** (Washington, *DC:* June 1991), p. xv.

El Barrio Popular Education Program, NY; photo by Jeff Hegger

Changes occurring in society today suggest that any definition of what it means to be literate will also need to change. For example, although most recent high school graduates have received instruction in computers, many older adults have never had the chance to develop technology skills.

- Resources—know how to allocate time, money, materials, space, and staff;
- *Interpersonal* skills—be able to work on teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds;
- *Information—be* able to acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information;
- Systems-understand social, organizational, and technological systems, monitor and correct performance, and design or improve systems; and
- *Technology—be* able to select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment.

Table 2-1 lists the eight SCANS requirements along with the lists of workplace skills from three other selected reports. Although some of the skills and competencies differ, there is a fair degree of overlap and consensus. Broadly speaking, the skills fall into four groups: academic skills (e.g., reading and writing), social skills (e.g., oral communication and teamwork), organizational skills (e.g., problem solving and leadership), and attitudinal skills (e.g., motivation and good work habits) .22

22 Russell W. Rumberger, ''The Definition and Measurement of Workplace Literacy, *California's Workforce for the Year 2000: Improving Productivity by Expanding Opportunities for the Education and Training of Undeserved Youth and Adults,* study papers, California Workforce Literacy Task Force (Sacramento, CA: January 1991).

Table 2-I—Workplace Skills and Competencies: Some Examples From Selected Reports

Skill areas	SCANS	American Society for Training and Development	National Academy of Sciences	Stanford study
Academic	• Basic skills • Thinking skills	• Reading, writing • Computation • Learning to learn	• Reading, writing • Computation • Reasoning • Science and technology • Social and economic studies	• Written communication • Numeracy • Reasoning • Learning
Social	• Interpersonal skills	• Communication • Interpersonal skills • Teamwork • Negotiation	• Oral communication • Interpersonal relationships	• Oral communication • Cooperation • Working in groups • Peer training • Multicultural skills
Organizational	. Resources • Information • Systems	• Problem solving • Creative thinking • Organizational effectiveness • Leadership	• Problem solving	• Problem solving • Decision making • Evaluation • Planning • Obtaining and using information
Attitudinal	• Personal qualities	• Self-esteem • Goat-setting/motivation • Personal/career development	• Personal work habits and attitudes	• Initiative
Other	• Technology		—	—

KEY: SCANS= Secretary's Commission on Achieving Necessary Skills.

SOURCES: Russell W. Rum berger et al., *Educational Requirements for New Technologies* and Work Organization: *Research Plan* (Stanford, CA: Stanford University, 1989); Anthony P. Carnevale et al., *Workplace Basics: The Skills Employers* Want(Washington, DC: The American Society for Training and Development, 1988); National Academy of Sciences, Report of the Panel on Secondary Education for the Changing Workplace, *High Schools and the Changing Workplace: The Employers' View* (Washington, DC: National Academy Press, 1984); and Secretary's Commission on Achieving Necessary Skills, What *Work Requires of Schools* (Washington, DC: U.S. Department of Labor, June 1991).

No research defines which skills area prerequisite for all types of work. Similarly, there is little concrete information on the 'basic' skill requirements of various jobs in the United States.[23] Nonetheless, the consensus represented in these and other reports seems to be that ''workplace basics' should be expanded to include more than just academic and technical skills; organizational skills, social skills, and attitudinal qualities all may contribute to employability.

Literacy Skills for Family Life

Another area of literacy that has received increased attention in recent years focuses on families. Parents of young children are faced with new demands as their children prepare for and enter school. Many of these parents are unable to participate actively in their children's education. This parental interest and motivation, coupled with evidence that higher levels of parental education are related to better educational outcomes for children, has led to a growing focus on family or intergenerational literacy efforts. These programs aim to help parents (or other caregivers) improve their own basic skills while they learn new ways to incorporate reading, writing, and communication skills **into the lives of their** children. The benefits are thought to be twofold:

[23] Ibid.

as they improve their own life chances through increased education, caregivers also improve the chances that their children will be successful in school.

Box 2-B provides some examples of the kinds of skills and competencies family literacy programs seek to provide. Beyond basic skills, parents often gain skills and knowledge related to improving parent-child relationships, understanding child development, providing supervision, setting positive expectations, using written materials at home, and becoming involved in the child's school and other community organizations.

Scientific Literacy

Throughout this century enormous advances have been made in science and technology, and many of the serious problems of today's world require an understanding of scientific and technological concepts+. g., acid rain, shrinking tropical rainforests, pollution, disease, population *growth*, and proliferation of nuclear technologies. Some educators have argued that the future depends in large measure on the wisdom with which people use science and technology. Many believe that all U.S. citizens need abetter grasp of science. For example, the American Association for the Advancement of Science has recently launched a major initiative to define what constitutes scientific literacy in a modern society and outline a plan for achieving it.[24]

Another initiative focuses on how the Federal Government can increase public understanding of science.[25] A workin$_g$ committee reporting to the presidential Office of Science and Technology Policy has adopted the following goal: "By the year 2000, all segments of the American population will show improvement in scientific literacy and will display increases in the knowledge and skills necessary to make informed decisions. ' '[26] They describe a scientifically literate American as one who can:

> . . . participate in discussions of contemporary scientific issues, apply scientific information in personal decision making, locate scientific information when needed, and distinguish valid information and sources from those that are not. To be scientifically literate, an individual should possess the skills necessary to understand and evaluate publicly disseminated information on science and technology and interpret graphic displays of scientific information.[27]

So What Skills Do People Need?

Although it would be nice to be able to answer this question by stating a clear, concrete set of skills that a person needs to acquire to be considered "literate,' the answer has to be "it depends. ' As the discussion shows, literacy involves not one or two skills but a wide and diverse profile of skills and knowledge. Moreover, ''. . . literacy is not an all-or-nothing state like small pox or pregnancy. It is instead a continuum of skills that are acquired both in and outside of formal schooling and that relate directly to the ability to function within society. '[28] There is no absolute threshold of skill or competency above which people can be certified as literate and below which they can be said to have a literacy problem.

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24 F. James Rutherford and Andrew Ahlgren, *Science for All Americans (New* York, NY: Oxford University Press, 1990).

25 Office of Science and Technology Policy, Federal Coordinating Council for Science Engineering, and Technology: Committee on Education and Human Resources, Public Understanding of Science Subgroup, "Report on the Expert Forum on Public Understanding of Science, " Alexandria, VA, Aug. 20-21, 1992, unpublished report, 1992.

26 Office of Scienc$_e$ and Technology Policy, Committee on Education and Human Resources, Subcommittee on Public Understanding of Science, "Strategic Plan for Public Understanding of Science, " unpublished report, Sept. 15, 1992.

27 Ibid., p. 1-2.

28 Venezky et al., op cit., footnote 2, p. 3.

Box 2-B—Family Literacy Skills: Some Examples

A number of programs have begun to adopt an intergenerational approach to literacy that recognizes the importance of viewing each adult not simply as an individual with literacy needs, but as part of a larger family network that includes children, spouses, and others. The focus is not solely on improving the basic skills of participants, but also on increasing their use of reading and writing in their everyday lives and with their children. The adult and child skills central to the goals of two family literacy programs are described here.

Even Start

Focusing on parents and children as a unit, Even Start projects have three interrelated goals: to help parents become full partners in the education of their children, to assist children in reaching their full potential as learners, and to provide literacy training for their parents.

Goals for children:[1]

- School Readiness:
  - Age-appropriate cognitive and language skills
  - Age-appropriate social skills
- School Achievement:
  - Age-appropriate language skills
  - Age-appropriate social skills
  - Improved school attendance
  - Low incidence special education, remedial placement and retention in grade
  - Satisfactory school performance

Goals for parents:

- Literacy Behaviors:
  - Shared literacy events with children
  - Increased use of literacy materials
  - Literacy resources in home
- Parenting Behavior and Skills:
  - Positive parent-child relationships
  - Home environment to foster child development
  - Positive expectations for child
  - Adequate supervision
- Education Skills and Expectations:
  - Increased basic skills/English language ability
  - Higher educational attainment
  - Improved job skills and employment status
- Personal Skills:
  - Increased self-esteem
  - Increased self-efficacy
  - Increased personal well-being
- Community Involvement
  - Increased involvement in schools
  - Access to social services

Kenan Trust Family Literacy Program

The primary goal of the program is to break the intergenerational cycle of undereducation and poverty by improving parents' skills and attitudes toward education, improving children's learning skills, improving parents' childcare skills, and uniting parents and children in a positive educational experience.

Goals for children:[2]

- Change the system of meaning within the home so children receive messages conveying the importance of education, the value of schooling, the importance of personal responsibility, and hope of achieving education, employment, and a successful adult life.
- Increase the development skills of preschool children to prepare them better for academic and social success in school.

Goals for parents:

- Provide a role model for the child of parental interest in education.
- Improve the relationship of the parent and child through planned, structured interaction which:
  a) Demonstrates to parents their power to influence their child's ability to learn;
  b) Increases the influence of literacy in the home so parents can help their children continue to learn;
  c) Identifies and encourages treatment for physical or mental handicaps of children in the program.
- Improve parenting skills of the adult participants.
- Enable parents to become familiar with, and comfortable in school settings.
- Raise the education level of parents of preschool children through instruction in basic skills.
- Help parents gain the motivation, skills, and knowledge needed to become employed or to pursue further education or training.

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[1] Program goals are quoted from Robert St.Pierre et al., *National Evaluation of the Even Start Family Literacy Program: First Year Report,* prepared for U.S. Department of Education (Cambridge, MA: Abt Associates, Inc., Oct. 28, 1991), p. 6.

[2] Program goals are quoted from Sharon Darling and Andrew E. *Hayes, Breaking the Cycle of Illiteracy: The Kenan Family Literacy Model Program, Final Project Report 1988-89* (Louisville, *KY: The National* Center for Family Literacy, n.d.), pp. 19-35.

Literacy is not an on/off characteristic, and it is more than the ability to read and write a little. Literacy describes a wide variety of communicative acts, interpersonal strategies, and survival skills. It is more appropriate to picture a spectrum of literacies across a variety of specific needs and communities, from barely able to write or recognize your own name to highly and multiculturally educated. It is more accurate to ask whether people are ***sufficiently*** literate to meet their own needs and what society expects of them than to ask if they are literate.[29]

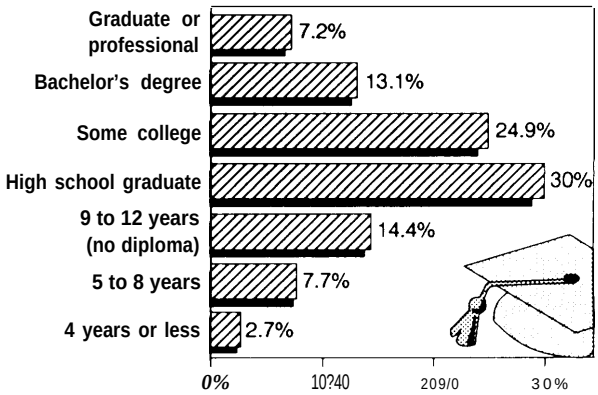
DEMOGRAPHICS OF ADULT LITERACY

Despite all the complexities, addressing the literacy needs of the Nation ultimately requires some way to understand the size and scope of the problem. Who is affected? Who should receive educational services? What resources are needed to meet the literacy needs of U.S. adults effectively? What literacy skills does today's technological society require for adults to function effectively? What skills might be required to meet societal demands 10 or 20 years from now? Answers to these and other questions require some method of defining and measuring the dimension of "adult literacy. " This section examines some common ways of defining and measuring "literacy," and presents some estimates of the number of U.S. adults who lack adequate skills.

School Completion Rates

School attainment has been the most commonly used 'measure' of literacy for the Nation. In the 1930s, the Civilian Conservation Corps defined "functional literacy" as 3 or more years of schooling, assuming that a person with that much schooling could read the essential print materials of daily life. Over time, the number of years of schooling thought to equal adequate literacy has increased. During World War II, the Army defined fictional literacy as equivalent to a 4th-grade education. In 1947, the Census Bureau applied the term "functional illiterates" to anyone with less than 5 years of schooling; 5 years later, in 1952, they raised it to the 6th grade. By 1960, the U.S. Office of Education had adopted 8th grade as the standard and ". . . finally, by the late 1970s, some noted authorities were describing fictional literacy in terms of high school completion. '[30]

Figure 2-l-Highest Level of Education Attained by U.S. Adults Ages 25 and Over, 1990



SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census, unpublished **data, tb. ED90-1.**

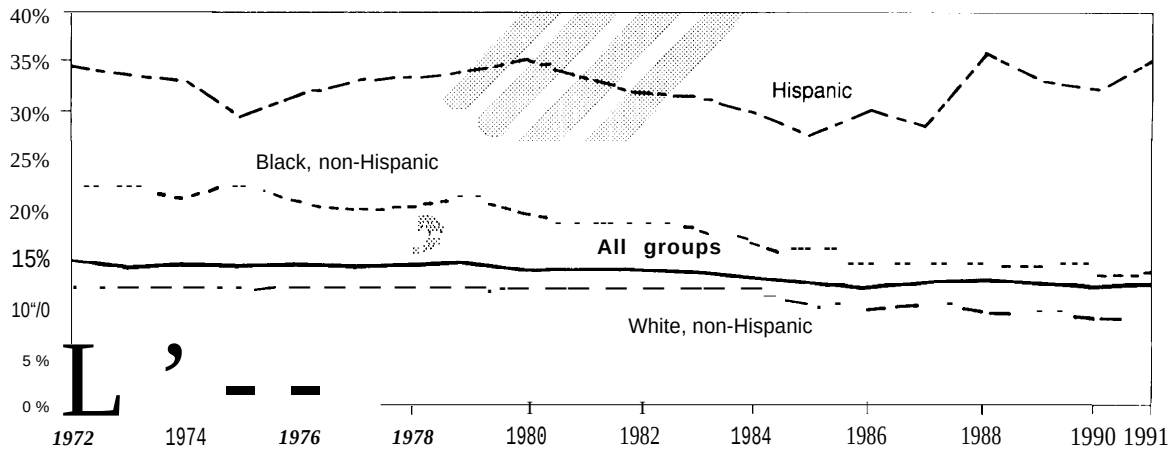
Figure 2-1 presents the school completion rates as surveyed in the 1990 census. If the completion of 4 years of schooling is considered a sufficient literacy goal, then 97.3 percent of today's adult population meet this standard. However, if the much higher standard of a high school diploma is used, then only 75.2 percent of adults would be considered ''literate'—this means over 39 million adults have inadequate schooling.

School attainment figures show literacy rates vary considerably for different age cohorts. Over-

29 Anabel P. Newman and Caroline Beverstock, *Adult Literacy: Contexts and Challenges* (Newark, DE: International Reading Association, 1990), p. 49.

30 Stedman and Kaestle, op. cit., footnote 5, p. 92.

Figure 2-2—Dropout Rates for Persons Ages 16 to 24,1972-91



Since 1970, considerable progress has been made in decreasing the number of black dropouts. White dropout rates have decreased slightly. The Hispanic rate has remained high.

NOTE: Figure includes persons ages 16 to 24 who were not enrolled in and had not graduated from high school. The racial-ethnic group categories used here are those defined by the Bureau of the Census.

SOURCE: Data from U.S. Department of Commerce, Bureau of the Census, Current Population Survey presented in U.S. Department of Education, National Center for Education Statistics, Dropout *Rates in the United States, 7997* (Washington, DC: U.S. Government Printing Office, September 1992), fig. 5.

all, high school graduation rates are much lower among older Americans. While less than one-half of adults over age 75 are high school graduates, 86.6 percent of those between 25 and 44 have attained this level.

Nationally, dropout rates have been declining for blacks and whites, but not for Hispanics (see figure 2-2). Between 1972 and 1991, rates for blacks dropped from 21 to 14 percent and for whites from 12 to 9 percent.[31] Rates for Hispanics have shown no consistent trend, but have remained high. However, Hispanics make up an increasing proportion of all dropouts, because the total population of Hispanics ages 16 to 24 increased during this time period while the populations of whites and blacks did not. In 1991, 16- to 24-year-old dropouts were 50 percent white, 32 percent Hispanic, and 16 percent black (see table 2-2, column d).[32]

Other demographic data, shown in table 2-2, indicate that in 1991, there were similar numbers of male and female dropouts between ages 16 and 24. Dropout rates were higher in homes with low-incomes (26 percent) than in middle- (12 percent) or high-income homes (3 percent). People between the ages of 16 and 24 were more likely to be dropouts if they lived in central cities (16 percent), than in suburban (9 percent) or nonmetropolitan areas (11 percent). However, using absolute numbers of 16- to 24-year-old

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31 Figures presented here are status dropout rates, which represent the proportion of individuals at any given time who are not enrolled in school and have not completed high school. There are a number of different ways of measuring dropout rates; for further discussion of these measures and some of the methodologies issues involved, see U.S. Department of Education, National Center for Education Statistics, Dropout *Rates in the United States: 1991* (Washington, *DC:* U.S. Government Printing Office, September 1992).

32 Ibid., p. 21. The population of whites ages 16 to 24 has decreased from approximately 28 million in 1980 to around 22 million in 1991. The black population of 16-to 24-year-olds has held relatively constant during this time period at about 4 million. The population of Hispanics ages 16 to 24 has increased from approximately 2.5 million in 1980 to around 3.5 million in 1991.

Table 2-2—High School Dropouts Ages 16 to 24, by Sex, Race-Ethnicity, Income, Region, and Metropolitan Status, 1991

	(a) Population (in millions)	(b) Number of status dropouts (in millions)	(c) Status dropout rate (percent)	(d) Percent of all dropouts	(e) Percent of population
Sex					
Male	**15.4**	**2.0**	13.00/0	**51** .6%	49.40/0
Female	**15.8**	**1.9**	11.9	48.4	50.6
Race-et ethnicity[a]					
White, non-Hispanic	21.9	**2.0**	8.9	**50.3**	70.2
Black, non-Hispanic	4.5	**.6**	13.6	**15.7**	14.4
Hispanic	3.5	**1.2**	35.3	**32.0**	11.3
Family income[b]					
Low-income **level**	5.9	1.6	26.5	40.1	18.9
Middle-income level	18.1	2.1	11.8	55.0	58.2
High-income level	7.1	.2	2.7	4.9	22.9
Region[c]					
Northeast	5.9	*.5*	**9.1**	13.7	18.8
Midwest	7.8	*.8*	**9.7**	19.5	24.9
South	10,8	1.5	**14.1**	39.3	34.7
West	6.7	**1.1**	**15.9**	27.5	21.5
Metropolitan status					
Central city	10.5	**1.7**	**16.3**	45.4	33.8
Suburban	14.1	**1.3**	**9.4**	34.9	45.1
Non metropolitan	6.6	**.7**	**11.3**	19.7	21.1
Total	31.2	3.9	12.5	**100.0**	100.0

a Not shown separately are non-Hispanics who are neither black nor white, but who are included in the total. These racial-ethnic group categories are those defined by the Census Bureau.
b Family income is current residence. Low income is defined as the bottom 2(J percent of all family incomes for 1991; middle income is between 20 and 80 percent of all family incomes; and high income is the top 20 percent of all family incomes.
C The Northeast consists of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The Midwest consists of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The South consists of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, Washington, DC, and West Virginia. The West consists of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

NOTE: Percentages may not sum to 100 percent due to rounding.

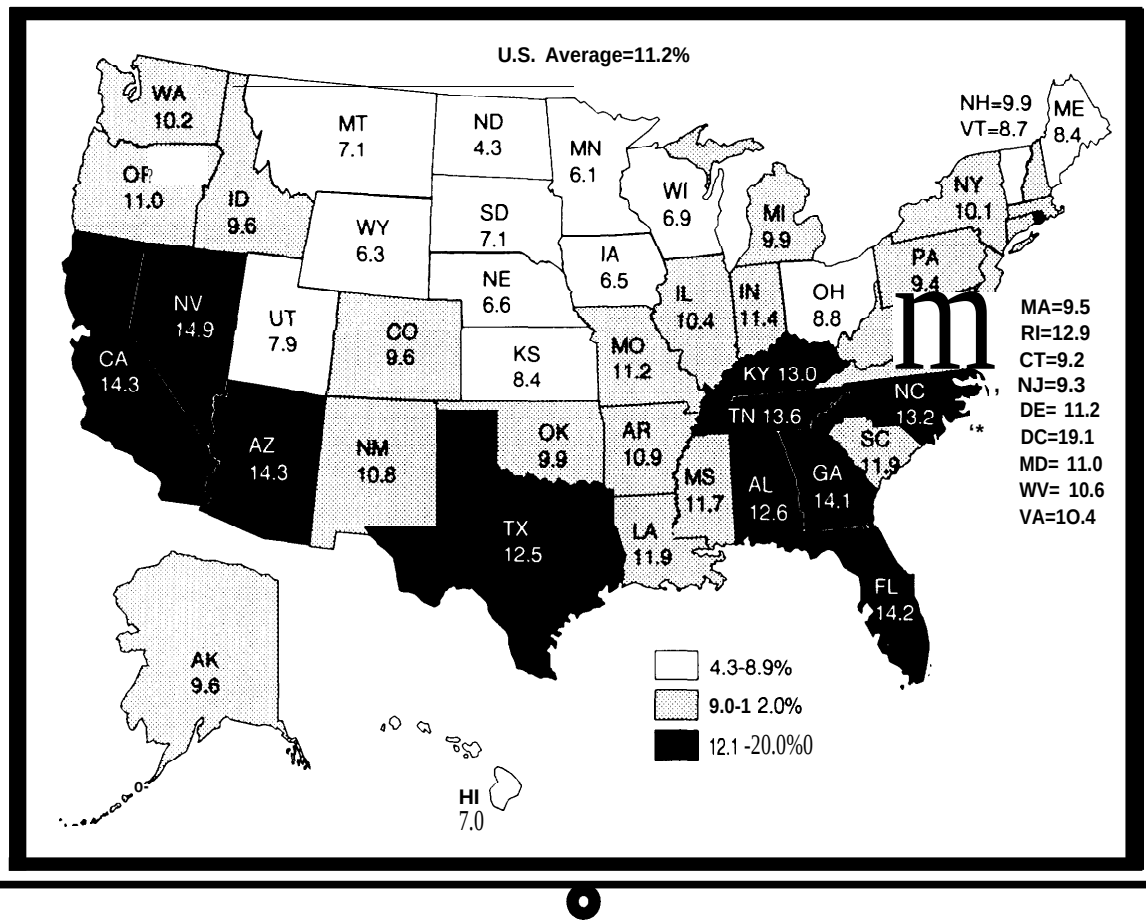
SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey 1991 data in National Center for Education Statistics, *Dropout Rates in the United States: 7991* (Washington, DC: U.S. Department of Education, September 1992).

dropouts (column b), 1.7 million lived in central cities, 1.3 million in suburbs, and 0.7 million in nonmetropolitan areas, indicating that substantial numbers of dropouts live in suburbs as well as central cities.

Data from the 1990 census also allow a regional examination of recent dropout rates. In 1990, about 1.6 million, or 11.2 percent, of all 16- to 19-year-olds were high school dropouts. When dropout rates were computed for each State, the rates ranged from 4.3 percent in North Dakota to 14.9 percent in Nevada and 19.1 percent in the District of Columbia. A total of 25 States had rates between 9 and 12 percent, while 14 States had rates below 9 percent; 11 States plus the District of Columbia fell above 12 percent (see figure 2-3).

Data on school attainment and dropout rates confirm that since the turn of the century, significant progress has been achieved in

Figure 2-3-Percentage of High School Dropouts Ages 16 to 19, by State, 1990



NOTE: All persons ages 16 to 19 who were not enrolled and had not graduated from high school were counted as dropouts.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Dropout Rates in the United States:1991* (Washington, DC: U.S. Government Printing Office, September 1992), fig. 4.

increasing the numbers of Americans who complete secondary school.[33] Even with no change in the high school dropout rate, high school completion levels will rise for the Nation as a whole as the population ages and the cohort of older, less-educated adults becomes a smaller portion of the population.

The most significant problem with using school attainment as an index of literacy is that it reveals very little about actual knowledge and skills possessed by adults. The skills of adults with the same level of educational attainment vary widely. Indeed, there are many knowledgeable and skilled adults whose formal levels of schooling are not high.

Furthermore, although most analyses of employment and earnings demonstrate better outcomes for high school graduates than for drop-

33-Id L. Hodgkinson, *All One System: Demographics of Education—Kindergarten Through Graduate School* (Washington, DC: Institute of Educational Leadership, 1985).

outs, academic skill levels also influence these outcomes. Within each group-high school graduates and high school dropouts-those with better academic skills earn more.[34] In addition, lower levels of basic skills are associated with the increased likelihood that young adults (ages 18 to 23) will experience other difficulties such as joblessness, poverty, dropping out of school, and unwed pregnancies.[35]

Tests of Literacy Skills

One response to these arguments is to try to estimate literacy rates by testing people's skills directly. Beginning in the 1970s, survey researchers began to assess people's

> . . . ability to read bureaucratic forms, instructions, and advertisements that are encountered in most adults' lives. . . . The 1970s estimates of functional illiteracy ranged from 15 percent to over 50 percent of the American population, , . . Not only did the studies produce varying estimates of illiteracy, but each single report contained estimates that differed depending on which cut-off point was used.[36]

One of the most popular, and seemingly straightforward, methods of measuring "literacy' is to assess the difficulty of the reading material a person (or a group of people) can read. For example, it is common to hear reports of high school graduates who read at an 8th-grade level or large numbers of adults unable to read newspaper stories written at the 1lth-grade level.

Many attempts have been made to try to rate common ''real-life' reading materials assumed necessary for everyday functioning. Although these methods depend on readability formulas, which can give widely disparate results, some interesting findings have been reported. For example, newspaper articles are reported to vary between **9th** and 12th grade, while newspaper election coverage tends to be written at the college level. Best sellers, in contrast, have averaged around the 7th-grade level for the past 50 years. Some reports have suggested that many societal tasks are quite difficult:

> An apartment lease and food-stamp notices, for example, are at the college level, an insurance policy is at the twelfth-grade level, and an aspirin bottle is at the tenth-grade level. Antidote instructions on a bottle of corrosive kitchen lye are at the ninth-grade level, while tax forms and directions on how to prepare a T.V. dinner are at the eighth-grade level. Only a driver's license manual, estimated to be written at a sixth-grade reading level, falls within the grasp of many in the bottom 30 percent.[37]

The use of reading level estimates is fraught with technical and conceptual problems.[38] The primary difficulties include the following:

Determining what it means—Technically, reading level means ''. . . that grade at which the average student can understand 75 percent of what is presented."[39] Thus materials assigned an 8th-grade reading level may not be fully understood by all persons reading at that level. An individual's reading skills also vary a great deal depending on such factors as background knowledge, interest, and familiarity with particular written materials (see chapter 3).

Conceptual limitations—Most modem definitions of literacy include much more than reading,

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34 Gordon Berlin and Andrew Sum, *Toward a More Perfect Union: Basic* **Skills,** *Poor Families, and* **Our Economic** *Future* (New York, NY: Ford Foundation, February **1988).**

35 Ibid,

36 Richard Venezky et al., op. cit., footnote 2, pp. 13-15. See also St-ad Kaestle, op. cit., footnote 5, for a more complete description of some of these survey efforts.

3-I Stedman and Kaestle, op. cit., footnote 5, p. 115.

38 See also Kenneth Cadenhead, ' 'Reading Level: A Metaphor That Shapes Practice,'' ***Phi Delta Kappan,*** February 1987, pp. 436-441.

39 Stedman and Kaestle, op. cit., footnote 5, p. 113.

encompassing such skills as oral communication, writing, problem solving, reasoning, and computation. By focusing exclusively on reading level scores, many argue, we ignore these and other critical literacy domains.

Technical problems—Determining reading levels depends heavily on the particular test used, the types of reading skills tested and the difficulty of the items. In addition, readability formulas, used to determine difficulty, are not widely agreed on, and so give different results.

In the 1970s, survey researchers began to focus on a broader view of literacy and to test people directly for their ability to read a wide range of everyday materials and complete associated tasks. For example, in the Survival Literacy Test, adults were asked to complete five forms: a Social Security number request, a bank loan application, a driver's license application, a public assistance form, and a Medicaid form.[40] National studies conducted in the 1970s and early 1980s attempted to set some criteria to distinguish "functional literates' from "illiterates." Many of these studies were criticized for using arbitrary cutoff points or for ranking all people on a single scale-implying that literacy is one-dimensional, rather than a more complex set of skills.[41]

The most recent national survey of 'literacy" has attempted to correct some of the limitations of earlier studies. In 1984, NAEP began the Young Adult Literacy Assessment to examine the abilities of young adults ages 21 to 25. Instead of trying to produce a single estimate of functional illiteracy, this study attempted to emphasize the multiple nature of literacy skills and to report how many young adults had reached various skill levels on different kinds of tasks. To do so, the NAEP Young Adult Study adopted the following definition of literacy based on the advice of panels of experts: "Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential, '[42]

The NAEP study characterized literacy skills in terms of the following three "literacy scales":

- prose literacy-the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and the like;
- document literacy—the knowledge and skills required to locate and use information contained in job applications or payroll forms, bus schedules, maps, tables, indexes, and so forth; and
- quantitative literacy—the knowledge and skills needed to apply arithmetic operations, either alone or sequentially, that are embedded in printed materials, such as in balancing a checkbook figuring out a tip, completing an order form, or determining the amount of interest from a loan advertisement.[43]

Performance in each of these areas is described in terms of a proficiency scale that extends from O to 500.[44] Tasks are placed along the scale to describe various levels of proficiency; increasingly difficult tasks characterize higher levels on the proficiency scales. Literacy skills can then be described in terms of the numbers of young adults who successfully complete tasks at each proficiency level. (See figure 2-4 for examples of document literacy tasks at different proficiency levels.)

The conclusions of this study include the following:

1. Most young adults demonstrate the skills and strategies necessary to complete tasks at the lower end of all three literacy scales. Such tasks

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40 Louis Harris and Associates, *Survival Literacy Study* (Washington, DC: National Reading Council, IWO).

41 Stedman and Kaestle, op. cit., footnote 5.

42 Irwin S. Kirsch and Ann Jungeblut, *Literacy: Profiles of America's Young Adults*, No. 16-PL-02 (Princeton, NJ: National Assessment Of Educational Progress, 1986), p. 3.

43 Ibid., p. 4.

44 The mean of this scale was set at 305 with a standard deviation of about 50.

include writing a brief description about a job, locating a fact in a sports article, matching grocery coupons to a shopping list, entering personal information on a job application, and filing in information on a phone message form. ''The overwhelming majority of America's young adults are able to use printed information to accomplish many tasks that are either routine or uncomplicated. '[45] The authors conclude that " . . . it is clear from these data that 'illiteracy is not a major problem for this population.

2. Sizable numbers of young adults have difficulty with tasks of moderate complexity.

> Basic skills in uncomplicated applications show high mastery. But in more complex contexts where judgments of relevance and similarity must be made and several dependent steps or matches done, abilities decline dramatically. . . . There can be no doubt from these data that problem-solving skills are weak, that even college graduates often fail to consider all relevant information in a literacy task, or are confused by logical/mathematical data.[47]

3. White young adults obtained the highest scores on all three scales while black young adults scored one full standard deviation lower; the mean scores of Hispanic young adults tended to fall halfway between black and white adults, Although some of this difference is explained by the lower school attainment of blacks and Hispanics, the gap is reduced only slightly when attainment is controlled.[48] It is important to note, however, that although black and Hispanic young adults are overrepresented among the young adults with low literacy skills, the majority of this group is white, since whites make up 77 percent of young adults.

4. The above findings were further substantiated when the reading proficiency of these young adults was compared with NAEP samples of 4th-, 8th-, and llth-grade students. Further evidence that ''illiteracy is not a major problem is demonstrated by the finding that 94 percent of young adults read at or above the level of the average 4th grader. Roughly 80 percent reached or exceeded the average 8th-grade level, while 62 percent read as well or better than the average 1lth grader.

The results of studies that have attempted to assess literacy skills directly are complex and difficult to summarize. One group of researchers, having reviewed the major studies of functional literacy rates, concluded the following:

> Based on these studies, we find it reasonable to estimate that about 20 percent of the adult population, or around 35 million people, have serious difficulties with common reading tasks. An additional 10 percent are probably marginal in their functional-literacy skills.[49]

Literacy Target Groups

One of the reasons the size of the literacy problem is difficult to estimate is that literacy skills are not easy to observe or to measure. In addition, adults with low literacy skills have widely different needs. Thus another way to characterize the literacy problem is to examine target groups of the total population likely to have low literacy skills. The section that follows discusses three such groups: those without a high school diploma, immigrants/nonnative English

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45 Kirsch and Jungeblut, op. cit., footnote 42, p. 6

46 Ibid., p. 5. These authors note that about 2 percent of the young adult population were estimated to have such limited literacy skills that they could not complete the tasks. "Roughly one percent (or about half) of this group reported being unable to speak English. . . . The English speaking one percent. . . responded to a set of oral-language tasks. The comparatively low performance indicates that this group (about 225,000 people) may have a language problem that extends beyond processing printed information. '

47 Venezky et al., op. cit., footnote 2, P. 28.

48 Ibid, pp. 31-32. Racial-ethnic group categories used here are those used by the National Assessment of Educational Progress researchers.

49 Stedman and Kaestle, op. cit., footnote 5, P. 109.

Figure 2-4—Assessing Literacy Skills Used in Everyday Life: The Young Adult Literacy Assessment

The Young Adult Literacy Assessment was conducted in 1984 to survey the literacy abilities of young adults ages 21 to 25. Each participant was interviewed and asked to complete **tasks** similar to those encountered **by adults** in everyday life. Tasks were presented in each of three literacy domains: prose, document, and quantitative. Tasks of varying difficulty levels were used in each **area; performance was scored on a proficiency scale that extends from O to 500.** More difficult items characterize higher levels on the proficiency scale. The figure shows the Document Literacy **Scale and some sample tasks of varying difficulty that participants were asked to complete.**

SELECTED TASKS AT DECREASING LEVELS OF DIFFICULTY

365

Use bus schedule to select appropriate bus for
343 given departures & arrivals
334

320 Use sandpaper chart to locate appropriate grade given specifications

300 Follow directions to travel from one location to another using a map

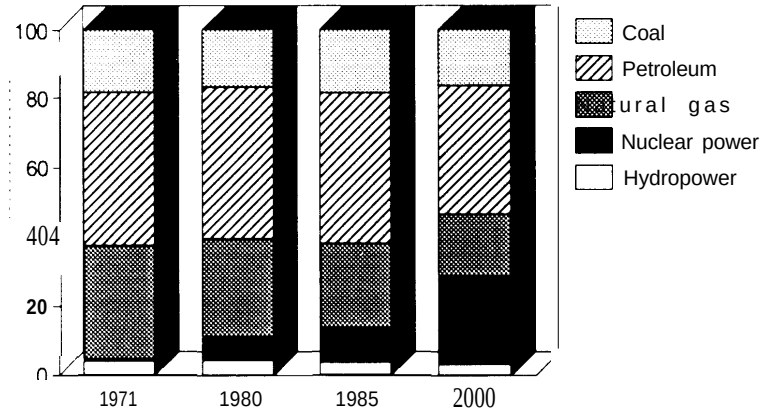
294 Identify **information from graph depicting . . . source of energy and year**

278 Use index from an almanac

262 Locate eligibility from table of employee benefits

The graph below shows prediction of United States energy consumption through the year 2000. Use the graph to answer the question that follows.

Estimated U.S. Power Consumption by Source



In the year 2000, which energy source is predicted to supply less power than coal?

A. Petroleum
B. Natural gas
C. Nuclear power
D. Hydropower
E. I don't know

257 **Locate gross pay-to-date on a pay stub**

255 Complete a check given information on a bill

253 Complete an address on order form

249 Locate intersection on street map

221 Enter date on a deposit slip

219 Identify cost of theatre trip from notice

211 Match items on shopping list to coupons

196 Enter personal Information on job application

192 Locate movie in TV listing in newspaper

181 Enter caller% number on phone message form

169 Locate time of meeting on a form

160 **Locate expiration date on driver's license**

110 **Sign your name**

HOURS				PERIOD ENDING					
REGULAR	2ND SHIFT	OVERTIME	TOTAL	03/15/85	REGULAR	OVERTIME	GROSS	DEF ANN	NET PAY
50 0			50 0	CURRENT	625 00		625 00		459 88
				YEAR TO DATE			4268 85		

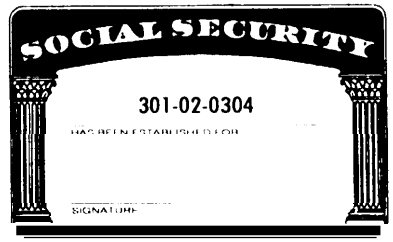
	FED WH	STATE WH	CITY WH	Flex
CURRENT	108 94	13 75		38 31
YEAR TO DATE	734 98	82 50		261 67

OTHER DEDUCTIONS				
CR UNION	UNITED FD	PERS IN	MISC	CODE

NON-NEGOTIABLE

OTHER DEDUCTIONS					
CODE	TYPE	AMOUNT	CODE	TYPE	AMOUNT
07	DEN	4 12			

Here is a wage and tax statement that comes with a paycheck.
What is the current net pay?_____
What is the gross pay for this year to date?_____



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

SOURCE: Irwin S. Kirsch et al., *Literacy: Profiles of America's Young Adults—Final Report, No.* 16-PL-01 (Princeton, NJ: National Assessment of Educational Progress, September 1986).

speakers, and those seeking jobs or better employment. These groups are not independent of one another-an individual who is counted in one group (e.g., no high school diploma) is often a member of another (e.g., nonnative English speaker).

Adults Without a High School Diploma

Because people can be identified fairly easily as either holding or not holding a credential such as a diploma, this group can be counted and identified. As figure 2-1 illustrates, 25 percent of Americans age 25 and over (39 million people) do not hold a high school diploma. In addition, about 4 million persons ages 16 to 24 had not graduated from high school and were not enrolled in 1991.[50]

Although this is the group that most conventional adult education programs target, people within this group have widely differing levels of basic skills. Although some of these individuals may be unable to read at the most rudimentary levels, most have already achieved some level of competence in reading and writing. For example, data from the Young Adult Survey indicate that approximately 75 percent of 21- to 25-year-olds who have no diploma can read at least as well as the average 4th grader.[51] Of those who stayed in school beyond the 8th grade, 54 percent read as well as the average 8th grader and 27 percent as well as the average 11th grader. Among those with lower educational attainment (O to 8 years), the figures were somewhat lower (37 percent for 8th grade and 15 percent for llth grade).

immigrants and Nonnative English Speakers

Another population of considerable interest in literacy efforts is immigrants and other adults not proficient in speaking English. As of 1989, approximately 16.5 million foreign-born people were legally residing in the United States; another 2 million undocumented immigrants were also thought to be living in the United States at that time.[52]

Immigration rates during the 1980s rank among the highest levels in U.S. history, surpassed only by the first two decades of this century (see figure 2-5). Approximately 6 million legal immigrants entered the United States during the 1980s. In addition, recent decades have shown a shift in the composition of immigrant populations.

> As recently as the 1950s, two-thirds of the legal immigrants to the U.S. came from Europe and Canada. By the 1980s, that percentage had dropped to 14 percent. In the '80s, 44 percent of the nation's legal immigrants came from Asia and 40 percent came from Mexico and other Latin American countries.[53]

It is difficult to estimate the literacy needs of this foreign-born population. Available data on the amount of schooling immigrants have received in their native countries reveal some interesting trends. For example, those immigrants entering the United States between 1975 and 1980 have completed the same number of years of school on average as the U.S.-born population (12.4 years, foreign born; 12.5 years, U.S.-born). However, these immigrants are concentrated at both the high and the low ends of the schooling distribution. A higher proportion of these immigrants have attended college (38 percent) than have people born here (32 percent). But a greater proportion of these immigrants are also found at the lowest education levels (31 percent have less than 9 years of schooling compared with 17 percent of U.S.-born). In contrast to this bimodal distribution for these immigrants, the largest proportion of the U.S. population clusters toward

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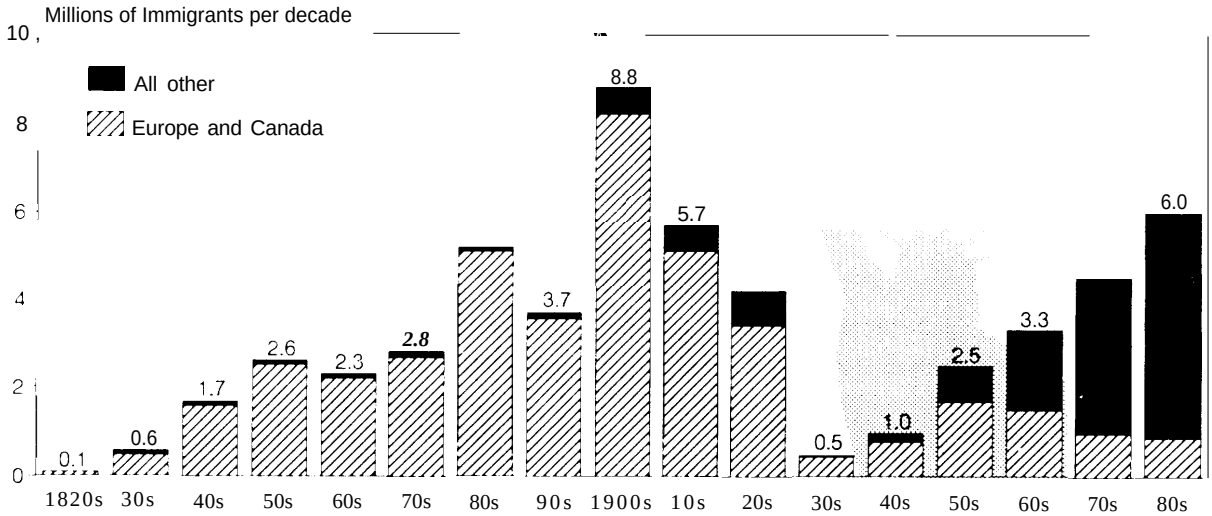
50 National Center for Education Statistics, op. Cit., footnote 31.

51 As tested by the National Assessment of Educational Progress in 1984. See Kirsch and Jungeblut, op. cit., footnote 42.

52 Karen A. Woodrow, *Undocumented Immigrants Living* in the *United States* (Washington, DC: U.S. Department Of Commerce, Bureau of the Census, August 1990).

53 "Illegal Immigration," *CQ Researcher*, vol. 2, No. 16, Apr. 24, 1992, p. 368.

Figure 2-5-@ gal Immigration to the United States, 1820s to 1980s



SOURCE: Data from the Immigration and Naturalization Service presented in "illegal Immigration," CQ Researcher, vol. 2, No. 16, Apr. 24, 1992, p. *370.*

the middle of the distribution at the high school completion level.[54]

Those immigrants at the lowest levels of education often have varying experiences with print materials and written languages as well as limited proficiency in speaking English. Many come from rural villages and tend to fall into three categories:

> . . . nonliterates, who cannot read or write in any language; semiliterate, who have the equivalent of a few years of formal education and minimal literacy skills; and non-Roman alphabetic literates, who are fully literate in their own language (such as Lao or Chinese) but who need to learn the Roman alphabet.[55]

Estimates of the total number of adults who have limited English proficiency are difficult to obtain. Most are based on self-reported answers to surveys conducted by the Bureau of the Census; such self-report data probably show lower numbers than a direct test of English language proficiency would indicate.

The 1990 census indicates that 25.5 million adults (13.8 percent of all adults ages 18 and over) speak a language other than English at home (see figure 2-6). Of these adults, about 75 percent report speaking English well or very well. However, a total of 5.8 million adults report that they speak English not well or not at all. These are self-reports of *spoken* language proficiency and tell us little about people's skills at reading or writing English.

People who do not speak English at home are heavily concentrated in several regions of the United States (see figure 2-7). California, with 8.6 million, has more than twice as many as any other State. Five States (California, Texas, New York, Florida, and Illinois) account for 63 percent of those adults who speak anon-English language at

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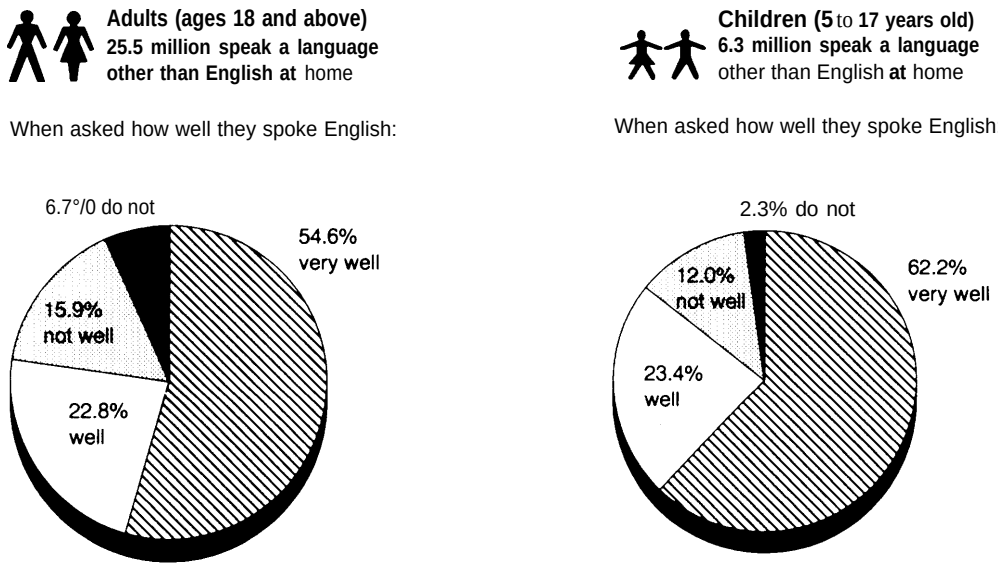
54 U.S. Department of Labor, *The Effects of Immigration on the U.S. Economy and Labor Market* (Washington, DC: U.S. Government Printing Office, 1989). Data on the educational attainment of immigrants entering the United States in the 1980s were collected in the 1990 census, but will not be available until 1993.

55 U.S. Department of Education, Office of Vocational and Adult Education, *Teaching Adults With Limited English Skills: Progress and Challenges* (Washington DC: U.S. Government Printing Office, October 1991), p. 13.

Figure 2-6-Ability to Speak English in Non-English Speaking Homes: 1990 Census



SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census, unpublished data, tbs. ED90-4 and ED90-5.

home. Ten more States have over 400,000 such individuals; these 15 States combined account for 84 percent of the nationwide population.

There are a number of States that have high proportions of non-English speakers, even though the absolute numbers are not particularly high. For example, New Mexico ranks highest among the States with 35.5 percent of its population reported to be non-English speakers at home. However, New Mexico has far fewer people who are non-English speaking than does California, which is second at 31.5 percent (0.5 million as compared with 8.6 million in California). Other States that have relatively high proportions of non-English speakers but comparatively low absolute numbers include Hawaii, Rhode Island, Nevada, Alaska, and the District of Columbia (see table 2-3 for proportions by State).

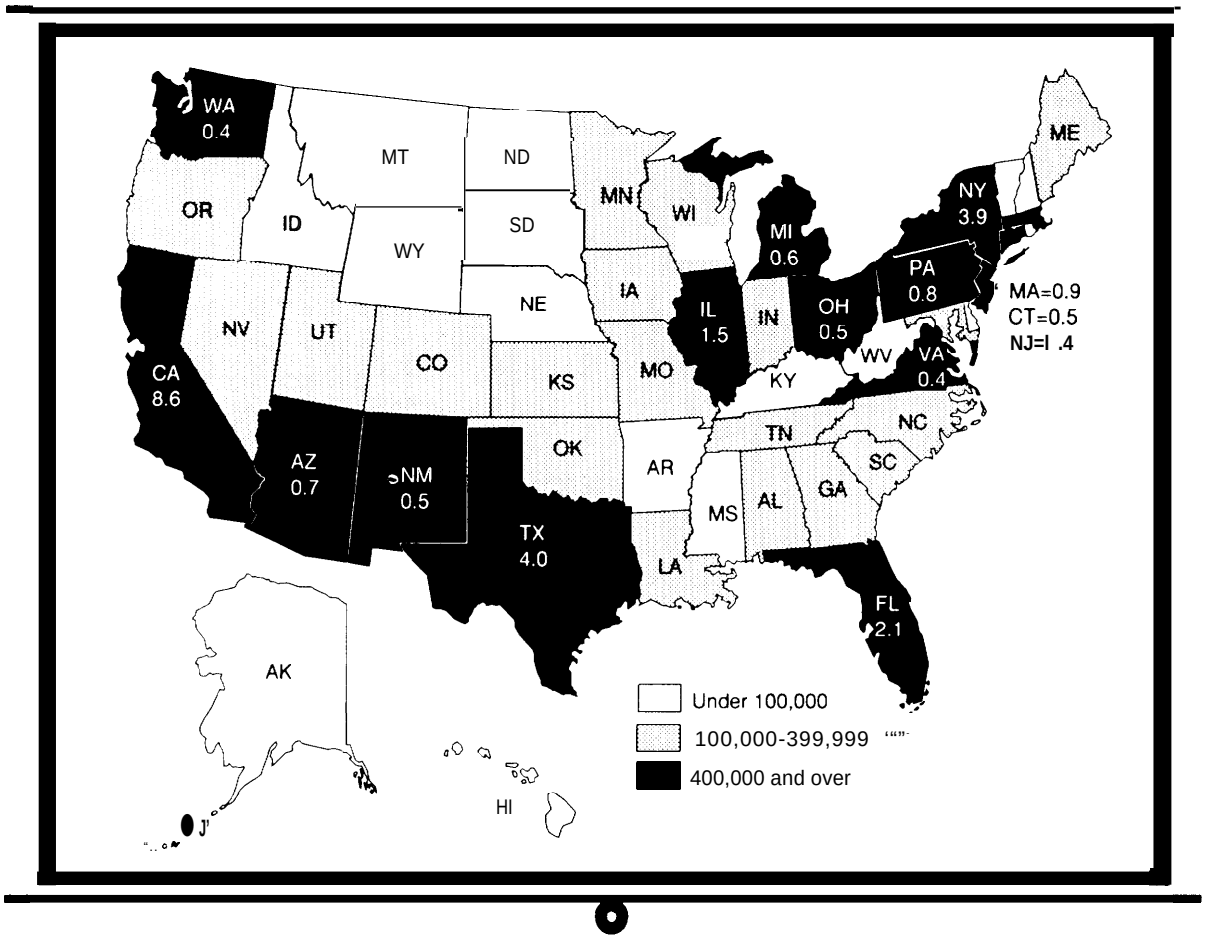
Those Seeking Jobs or Better Employment

There has been increasing interest in understanding the relationship between literacy skills and employment. Many experts today argue that there is a growing job-literacy gap-a discrepancy between the skills of our population and those required to per-form most of society's jobs. Estimates of the extent of this job-literacy gap have been very difficult to obtain, but the results that are available indicate that two different kinds of trend=' . . dumbing down and rising literacy demands-are occurring at different levels in the occupational pyramid and in different sectors.' '[56] (See box 2-C.)

Nonetheless, it seems useful, as another method of describing the literacy problem, to attempt to estimate the number of individuals who have difficulty finding or keeping employment because of literacy difficulties. The Department of Labor (DOL) has recently commissioned a study of the literacy skills of three groups served by DOL programs: persons enrolling in the Job Training Partnership Act (JTPA) programs, persons applying for jobs through the Employment System (ES), and persons filing claims for

56 Stedman and Kaestle, op. cit., footnote 5, p. 121.

Figure 2-7-Number of People, Ages 5 and Above, Speaking a Non-English Language at Home, by State, 1990



NOTE: The actual numbers (in millions) are given for States wfth 400,000 or more people speaking a non-English language at home.
SOURCE: U.S. Department of Commerce, Bureau of the Census, 1990 Census, unpublished data, tb. **ED 90-6.**

Unemployment Insurance (UI). This population, totaling about 20 million people, represents individuals who have experienced persistent difficulty finding jobs, who are unemployed and looking for work, or who are seeking better employment opportunities. ''These groups include a significant segment of Americans who, with proper assistance, could enhance their literacy skills and in turn contribute in large measure to the growth of our nation. ''[57]

Building on the framework established in the NAEP Young Adult Literacy Assessment, a sample of the DOL program participants completed literacy tasks in three areas: prose, document, and quantitative literacy. This assessment goes beyond the Young Adult study, however, in

[57] **Educational Testing Service,** "Workplace **Literacy**: A Project Conducted by ETS for **the Department** of Labor," **informational pamphlet, n.d.,** p. 3.

Table 2-3-States With 5 Percent or More of the Population (Ages 5 and Above) Speaking a Non-English Language at Home, 1990

Rank	State	Percentage
1.	New Mexico	35.5%
2.	California	31.5
3.	Texas	25.4
4.	Hawaii	24.8
5.	New York	23.3
6.	Arizona	20.8
7.	New Jersey	19.5
8.	Florida	17.3
9.	Rhode Island	17.0
10.	Connecticut	15.2
	Massachusetts	15.2
12.	Illinois	14.2
13.	Nevada	13.2
14.	District of Columbia	12.5
15.	Alaska	12.1
16.	Colorado	10.5
17.	Louisiana	10.1
18.	Maine	9.2
19.	Washington	9.0
20.	Maryland	8.9
21.	New Hampshire	8.7
22.	North Dakota	7.9
23.	Utah	7.8
24.	Oregon	7.3
	Pennsylvania	7.3
	Virginia	7.3
27.	Delaware	6.9
28.	Michigan	6.6
29.	South Dakota	6.5
30.	Idaho	6.4
31.	Vermont	5.8
	Wisconsin	5.8
33.	Kansas	5.7
	Wyoming	5.7
35.	Minnesota	5.6
36.	Ohio	5.4
37.	Montana	5.0
38.	Oklahoma	5.0

SOURCE: US. Department of Commerce, Bureau of the Census, 1990 Census, unpublished data, tb. ED 90-6.

setting five levels of literacy proficiency within each area, and describing the information-processing skills required for successful performance at each level.

The findings of this assessment show that large proportions of the DOL population demonstrate limited literacy skills. Overall, tasks at levels 1 and 2 (the lowest two of the five defined levels) were found to ''. . . require relatively low-level information processing skills and it seems likely that skills evident at these levels would place severe restrictions on full participation in our increasingly complex society, including the workplace. ''[58] Approximately 40 to 50 percent of the JTPA and 40 percent of the ES/UI populations demonstrated literacy skills at these two lowest levels compared with slightly over 30 percent of the NAEP sample of young adults.[59] Of the total population of roughly 1 million JTPA and 19 million ES/UI participants, approximately 7.5 to 8.5 million are estimated to have significant literacy limitations. Regarding those adults who demonstrated skills at levels 1 and 2, the authors concluded:

> Unless an attempt is made to upgrade the level of literacy skills of these individuals, their success in job training programs may be limited, thus denying them access to the job market. Moreover, for those individuals who do succeed in a job training program without a concomitant increase in their literacy skills, the question remains whether a demonstrated low level of proficiency will enable them to avoid future employment difficulties that may arise from projected increases in skill requirements.[60]

Even more striking are findings regarding these adults' responses to questions about their own

58 Kirsch et al., op. cit., footnote 16.

59 When data for DOL populations were compared with the performance of the young adult sample, many significant differences were found ($p < .05$). Both DOL populations had significantly more people at the two lowest proficiency levels for document literacy. For quantitative literacy, both DOL groups were more heavily represented at level 1, while only the JTPA group was significantly larger at level 2. The only significant difference for prose literacy was the larger representation of JTPA clients at level 1.

60 Kirsch et al., op. cit., footnote 16, pp. 9-10.

Box 2-C-The Future of Workplace Skills[1]

Changing workplace practices and related demand for technical training are elevating the level of basic skills needed for many jobs. Some industries with workforces of many low skill employees are confronting a need to upgrade their workers' basic skills as they adopt new technology and work practices. For example, the textile industry increasingly encourages employees to take advantage of workplace literacy programs offered by State and local agencies. Far from de-skilling work, the industry's investment in automated equipment has created a demand for more maintenance and repair people. While some low skill jobs have been eliminated by automation, many new jobs require greater skill.

Of course, not all jobs are changing in ways that require more skill of workers. Some jobs continue to be de-skilled or eliminated by automation, just as others are upgraded. There is disagreement about the overall direction of skill change, and how fast and pervasive the change is likely to be in the years to come. A recent study concluded that skills upgrading was limited primarily to best-practice firms. The study found no evidence to support the notion that there would be explosive growth in skill requirements in this decade. While occupational upgrading is occurring, the overall rate is slowing down compared with the 1960s and 1970s.[2]

The *Workforce 2000* report, by contrast, sees a major increase in occupational skill and education requirements by the year 2000. It found that more than one-half of the *new* jobs created between 1984 and 2000 would require people with some education past high school, and 30 percent of the new jobs would require a college degree.[3] But it is easy to overstate the implications of these projections. It is not clear how much of the projected increase in education would reflect skills needed by workers to perform their jobs versus other factors. For example, some employers use educational background as a way to screen job applicants. Moreover, the projected growth in education requirements only pertains to the one in six jobs that will be new in the year 2000; the educational background needed for all jobs will not change as dramatically.[4] Also, there are jobs in well-paid occupations (e.g., several construction trades, mechanics, repairers, and many sales and marketing jobs) that do not require college degrees that are projected to grow faster than average, although some of these may entail postsecondary education or apprenticeship.

In the end, there are several points that have come out of the debate about upskilling and de-skilling:

- The economy will continue to create many lower skill jobs. It seems unlikely that skill requirements for these jobs will change greatly over the next decade; some may be de-skilled, a few maybe upskilled. These jobs also will not require much formal education beyond high school.
- Some jobs in some industries that have traditionally been defined as low or medium skilled will be upgraded as companies adopt new technologies and work practices. Current workers in these jobs will need retraining to develop new job skills; outside applicants will find the hiring process more demanding than m the past.
- The fastest rate of job growth will be in high skill professional, technical, and managerial jobs-jobs that traditionally have required postsecondary education or college degrees.
- In many industries it has become more difficult for people without postsecondary education to progress from lower level positions within firms to higher level positions.
- Many of the workers who will join the labor force between now and the year 2000 will not be well matched to the better jobs created by the economy. Roughly one-third of the new entrants will come from minority groups that have traditionally received less and poorer quality education. Immigrants, many of whom need to develop English language skills, also will be a more important source of laborforce growth.

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1 This box is adapted from U.S. Congress, Office of Technology Assessment, *Worker Training: Competing in the New International Economy,* OTA-ITE *457* (Washington, *DC:* U.S. Government Printing mice, September 1990), pp. 155-157.

2 Lawrence Mishel and Ruy A. Teixeira, *The Myth of the Coming Labor Shortage: Jobs, Skills and Incomes of America's Workforce 2000* (Washington, DC: Economic Policy Institute, 1990), pp. 65-67.

3 William B. Johnston and Arnold H. ~&, *Workforce 2000: Work and Workers for the 21st Century* (Indianapolis, IN: The Hudson Institute, June 1987), p. 97.

4 See Russell W. Rumberger and Henry M. Levin, "Schooling for the Modern Workplace," *Investing in People: A Strategy to Address America's Workforce Crises, background* papers, vol. 1, prepared for the Secretary of Labor's Commission on Workforce Quality and Labor Market Efficiency ('Washington DC: U.S. Department of Labor, September 1989), pp. 95-98.

perceptions of the adequacy of their literacy skills.

> Some 65 and 60 percent of the JTPA and ES/UI client groups, respectively, perceive that they could get a better job if their reading or writing skills were improved and roughly 80 and 70 percent, respectively, report that their job opportunities would improve with increased skill in mathematics.[61]

Overall this translates into approximately 11.6 million DOL jobseekers who perceive their inadequate reading and writing skills to be a barrier to better employment and 14.9 million who perceive so for their mathematics skills. Taken **together, these findings indicate there is a significant need for adult education programs aimed at improving the literacy skills of jobseekers.**

Another method of anticipating needs for education is to examine what proportion of the current workforce has literacy skill limitations. Many workers are employed at jobs for which their skills seem adequate. But what would happen if their jobs changed substantially? Major national and global economic changes are driving labor market changes. For example, a special 1986 Bureau of the Census survey estimated that, between 1979 and 1984, about 5.1 million workers were displaced by major layoffs or plant closings from jobs they had held for more than 3 years.[62] How much of the current workforce might require improved literacy skills to benefit from retraining, keep a job with changing skill demands, or get a new job?

There is no clear answer to this question. Available data are usually based on specific companies that have surveyed the ''basic' skills (reading, writing, arithmetic, and oral communication) of their workers or examined the skill levels of displaced workers. OTA's earlier work bearing on these topics has concluded that most estimates of basic skills levels among employed workers have been based on data from only a few companies.[63] For example in one manufacturing firm, about 20 percent of the hourly workers were unable to cope with technical training because of deficient basic skills. Most of these workers had high school diplomas and did not think they had a basic skills problem.[64] OTA's 1986 analysis of displaced workers found that 20 to 30 percent of adults entering displaced worker programs in the mid- 1980s needed to improve their basic skills.[65]

Seeking Better Information

The task of defining and estimating literacy—knowing the magnitude and character of the problem-is not straightforward. Definitions of what literacy is and what it means to be literate have changed and continue to change. Studies of literacy rates become rapidly outdated. In addition, because literacy is a' 'hidden' problem, it is easy to underestimate and difficult to study. Literacy skills are more easily assessed for identifiable groups, such as those in job training programs or those graduating from high school, than for the population as a whole. Yet it is difficult to determine optimal policy directions without some sense of the size and scope of the Nation's literacy needs.

Another problem plaguing attempts to survey a nationally representative population is that of

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61 Ibid., p. 8.

62 U.S. Congress, Office of Technology Assessment, *Technology and Structural Unemployment: Reemploying Displaced Adults*, OTA-ITE-250 (Washington, DC: U.S. Government Printing Office, February 1986), pp. 105-109.

63 U.S. Congress, mice of Technology Assessment, *Worker Training: Competing in the New International Economy*, OTA-ITE *457* (Washington DC: U.S. Government Printing Office, September 1990).

64 Larry Mikulecky, "Second Chance Basic Skills Education," *Investing in People: A Strategy to Address Americans Workforce Crisis, background* papers, vol. 1, U.S. Department of Labor, Commission on Workforce Quality and Labor Market Efficiency (cd.) (Washington DC: U.S. Government Printing Office, September 1989), p. 236.

65 Office of Technology Assessment, op. cit., footnote 62.

those who remain ‘ ‘uncounted. ” Many surveys have to exclude those individuals who cannot complete the forms or answer the questions. For example, the NAEP Young Adult Survey found that about 2 percent of the population had ‘‘. . . such limited literacy skills that it was judged that the simulation tasks would unduly frustrate or embarrass them. "[66] Thus the NAEP conclusions about the literacy proficiencies of young adults are based on the **98** percent of the sample who were English-speaking and who were able to respond to the printed task. Similarly, during the base-year survey of the National Education Longitudinal Study of 1988, 5.4 percent of the students were excluded from the sample because they were unable to complete the questionnaire " . . . owing to limitations in their language proficiency or their mental or physical disabilities. ’[67]

Many surveys also sample only the noninstitutionalized population. This policy, while practical, may also contribute to further underestimation of the size of the total problem. For example, over 1 million adults were in prisons in 1990. Approximately 80 percent of U.S. prisoners are estimated to be high school dropouts.[68] These examples illustrate that those excluded from national samples may have some of the highest literacy needs.

The Adult Education Amendments of 1988 required the Department of Education to submit a report to Congress defining literacy and estimating the extent of adult literacy in the Nation. A nationally representative household survey of adults over 16 is currently being conducted by the Department under contract to the Educational Testing Service; inmates of Federal and State prisons are also included. The definition of literacy used in the NAEP Young Adult Literacy Assessment has been adopted. This approach will not yield a single number of ‘illiterates,’ but will " . . . produce a variety of estimates that show the percentages of adults performing tasks at different levels of difficulty. ’ ’[69]

Among the goals of the survey are the following:

- Describe the types and levels of literacy demonstrated by the total adult population, adults within specified age ranges, and adults comprising “at-risk” subgroups;
- Characterize and help explain demonstrated literacy skills in terms of demographic and personal background characteristics;
- For the first time, profile the prose, document, and quantitative literacy skills of the American workforce;
- Relate literacy skills to current labor-market indices as well as occupational categories; and
- Compare assessment results from this survey with those from the 1985 literacy assessment of young adults conducted by NAEP and with those from the Workplace Literacy Assessment being conducted for the U.S. Department of Labor.[70]

The information obtained from this survey should help educational planners, policymakers, and researchers understand the literacy needs of various populations, improve and design effective educational programs, and make decisions

66 Kirsch and Jungeblut, op. cit., footnote 42, p. 5. About one-half of those who could not Complete the survey were estimated to be Spanish-speaking. The other one-half were administered oral-language tasks; results suggested that many of these adults have a general problem with language not limited solely to the use of printed materials.

67 Philip Kaufman and Denise Bradby, *Characteristics of At-Risk Students in NELS:88* (Washington, DC: U.S. Department Of Education, National Center for Education Statistics, July 1992), p. 5.

68 Harold L. Hodgkinson, *A Demographic Look at Tomorrow* (Washington, DC: Institute for Educational Leadership, Inc., Center fOr Demographic Policy, June 1992).

69 U.S. Department of Education, ‘‘Report to Congress on Defining Literacy and the National Adult Literacy Survey, ’ unpublished repro% July 1990, p. 4.

70 Educational Testing Service, “National Adult Literacy Survey, ” brochure, n.d., p. 8.

about the best ways to use technology to reach larger segments of the population in need.

LITERACY NEEDS: GROWING OR SHRINKING?

As these estimates suggest, a large number of U.S. adults need to improve their literacy skills. As many as 20 to 30 percent of the adult population (35 to 50 million people) have difficulties with common literacy tasks. Howe\'er, to understand the Nations's literacy ''problem" more completely, one must consider not only the pool of people in need today, but also look at factors that may increase or decrease the numbers of people needing 1iteracy services tomorrow".

New people will continue to enter the pool of those with 1iteracy needs. Each year new immigrants, high school dropouts, displaced workers, and others will be added to the already large number of those who need to be served. Recent Census Bureau projections for the years 1992 to 2050 predict that new immigrants done will total about 1 million each year.[71] In its strategic plan for adult education, the State of California has estimated that the number of people with literacy deficiencies will grow by about 3 percent per year.[72] Applying this figure to the entire U.S. literacy pool produces an estimate of 1 to 1.5 million new entrants each year. One national estimate puts the number of new entrants to the adult basic education pool at 2.3 million.[73] Related factors such as rising or falling immigration or dropout rates will affect the numbers of adults who will enter the pool each year, and the effectiveness of adult literacy programs will influence the number of those who leave it.[74]

Any change in national goals for what a high school education should provide could also dramatically affect the number of adults who will require literacy services to reach those goals, "[f the average amount of schooling seen as necessary continues to rise, as it has throughout this century, and if the definition of skills essential to literacy continues to broaden, the number of adults needing literacy services could grow much larger. Demographic data also suggest that literacy needs are higher in some regions of the United States. Furthermore, projections of population growth indicate that the South and West will experience most of the growth in the Nation in the next decade .75 These are the same regions that tend to have higher dropout rates and higher numbers of non-English speaking homes (see figures 2-3 and 2-7). Strategies for adult literacy education need to consider these regional differences.

One strategy for reducing the pool of those with literacy needs is to try to lessen the number of new entrants. Such a preventive approach would seek to assure that today's children are successful in school and obtain the literacy skills they need, Although the absolute number of children in the

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71 U.S. Department of Commerce, Bureau of the Census, *Population Projections of the UnitedStates, by Age, Sex, Race and Hispanic Origin: 1992 to 2050* (Washington, DC: U.S. Government Printing Office, October 1992). This estimate represents a middle range projection and reflects 1990 immigration law changes, as well as current knowledge of emigration, undocumented migration, and movement to and from Puerto Rico. Higher assumptions about immigration would put the expected yearly totals at about 1.3 million, lower range assumptions at about 600,000 per year.

72 California State Department of Education, Adult Education Unit, *Adult Education for the 21st Century.' Strategic Plan to Meet California's L.mg-Term Adult Education Needs, 1989* ed. (Sacramento, CA: May 15, 1989).

73 Paul Delker, "Defining Adult Functional Literacy," *Functional Literacy and the Workplace: Proceedings of a National Invitational Conference, Washington, DC, May 6,1983* (Washington, DC: American Council of LifeInsurance, Education Services, 1983). This total is based on estimates of 1 million dropouts and nonfictional graduates,400,000 legal immigrants, 100,000 refugees, and 800,000 illegal entrants. Other estimates of illegal entrants are more conservative than this. The Bureau of the Census' best estimate adds about 200,000 net undocumented immigration to the United States each year. See Bureau of the Census, op. cit., footnote 71.

74 See ch. 4 for a discussion of the adult education providers and programs.

75 Hodgkinson, op. cit., footnote 68. See atso U.S. Department of Commerce, Bureau of the Census, *Projections of the Population of States by Age, Sex and Race: 1989 to 2010* (Washington, DC: U.S. Government Printing Office, January 1990).

population has remained relatively constant over the last two decades, their proportion of the population has declined dramatically and should continue to do so. In 1960, children under age 18 accounted for 36 percent of all Americans; by 2010, they are expected to comprise only 23 percent. Thus the pool of new entrants to the future workforce will grow smaller. Minorities, particularly Hispanic and Asian children, are expected to make up an increasing proportion of the population under age 18.[76]

The number of children living in homes where a language other than English is spoken is also increasing dramatically; while the 1980 census reported that 9 percent of 5- to 17-year-olds fell in this category, the 1990 figures have risen to 14 percent—an increase of almost 1.8 million school-age children over the previous decade.

These and related demographic trends suggest the following educational consequences:[77]

- The number of children entering school from poverty-level households is expected to increase.
- The number and proportion of minority school children will increase.
- More children will enter school from single-parent households.
- A larger number of children who were premature babies will enter school; these children are more likely to experience learning difficulties in school.

  There will be more school children who were born to teenage mothers and mothers who have not completed high school.
- More children will enter school from homes where a language other than English is spoken.

Carver Family Literacy Program, NC; photo by Bill Scott

Education has important intergenerational effects. When parents are assisted by literacy programs, they not only improve their own skills but also increase the chances of school success for their children.

Taken together, these projections suggest that the number of children entering school with one or more factors that put them at risk for educational difficulties will rise. The chances of any one child experiencing multiple risk factors is likely to increase as well.[78] Thus, the burden on an already resource-depleted school system is growing, not declining. Programs focused on optimizing early development, promoting school-readiness, and preventing school failure and school dropouts are extremely important interventions.[79]

Research findings have suggested another fruitful policy avenue for improving the future educational attainment of today's children. One of the most consistent findings of the research on positive educational outcomes for children is the influence of mothers' education level. This suggests the potential effectiveness of educational

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76 National Commission on Children, *Beyond Rhetoric: A New American Agenda for Children and Families* (Washington, DC: U.S. Government Printing Office, 1991).

77 Hodgkinson, op. cit., footnote *33;* and Aaron M. Pallas et al., "The Changing Nature of the Disadvantaged Population: Current Dimensions and Future Trends," *Educational Researcher, vol. 18, No. 5,* June-July 1989, pp. 16-22.

78 For a discussion of educational risk factors, see Pallas et al., Op. cit., footnote 77, pp. 16-22.

79 See, for example, R.E. Slavin et al. (eds.), *Effective Programs for Students At Risk (Boston,* MA: Allyn and Bacon, 1989).

interventions focused on mothers (or primary caretakers). One study, for example, found that:

> . . . having a mother who completed high school was a significantly more important determinant of the school enrollment of sixteen- to seventeen-year old youth than whether the mother was married or whether she had an additional $10,000 in family income per year, although both of these factors were also important. . . . Similarly . . . [another group of researchers] used data from the National Longitudinal Survey of Youth Market Experience to predict young people's test scores on the basis of their mothers' and fathers' education and other variables. They found that an extra grade of attainment for the mother-when father's education, race and region of the nation were constant-was associated with an extra half-grade equivalent of achievement for her children. Because of this intergenerational effect of the parent's education on the child's, it is unlikely that we will be able to make a major difference for the child unless we place equal priority on education and academic remediation for the parent.[80]

Educational efforts aimed at adults with low literacy skills today are likely to have two important outcomes: improving the skills and the life outcomes for adults, and at the same time increasing the likelihood of positive educational outcomes for those adults' children or future children.[81] As yet very little research evidence is available to document the direct effects on children of raising a parent's education level. Research in this area is needed in order to design programs that can optimize the direct benefits for children as well as parents. Existing evidence is compelling enough, however, to recommend that parents (especially mothers) of small children receive high priority in literacy policy and planning.

A comprehensive literacy policy must consider the changing needs of people throughout the life cycle. The challenge of adult literacy is to develop a long-range policy that anticipates the literacy needs of tomorrow while addressing what is already a large and demanding problem today.

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[80] Berlin and Sum, op. cit., footnote 34, p. 36.

[81] See, for example, Catherine E. Snow et al., *Unfulfilled Expectations: Home and School Influences on Literacy* (Cambridge, MA: Harvard University Press, 1991); and Thomas G. Sticht et al., *The Intergenerational Transfer of Cognitive Skills*, vols. 1 and 2 (Norwood, NJ: Ablex Publishing Corp., 1992).