



## Health Literacy: What Is It?

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## Commentary

### **Health Literacy: What Is It?**

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*The concept of health literacy evolved from a history of defining, redefining, and quantifying the functional literacy needs of the adult population. Along with these changes has come the recognition that sophisticated literacy skills are increasingly needed to function in society and that low literacy may have an effect on health and health care. We present a brief history of literacy in the United States, followed by a discussion of the origins and conceptualization of health literacy. Increased attention to this important issue suggests the need to review existing definitions of the term “health literacy,” because despite the growing interest in this field, one question that persists is, “What is health literacy?”*

In 2006, David Baker offered a perspective about the meaning and the measure of health literacy (Baker, 2006). He astutely acknowledged that there was a lack of shared meaning of the term “health literacy,” noting, “Ironically, as the field of health literacy has expanded in scope and depth, the term ‘health literacy’ itself has come to mean different things to various audiences and has become a source of confusion and debate” (p. 878). It seems that Baker’s goal of adopting a shared terminology of “health literacy” among researchers and other experts—which was also recommended by the Institute of Medicine (2004)—has not yet been realized.

In this commentary, we assess the status of the meaning of the term “health literacy”—looking both retrospectively and prospectively for wisdom and for direction. We begin with a historical review of the evolution of the definition and measurement of literacy in the United States. This reflection provides useful context and demonstrates the massive transformation that has occurred with literacy. The historical view will help to inform ideas about future directions in defining and measuring health literacy and supports an expectation that conceptualizations

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(and definitions) of health literacy will continue to evolve in response to rapid advancement in science and technology, as well as changes in delivery of health care and public health services, coupled with increasing expectations and responsibility on individuals and groups to be able to understand and act on the information.

Next, we look systematically at the variety of published definitions of health literacy and how they enhance our understanding of the evolution of the term and the overall construct. We offer suggestions for minor modifications to the most commonly used definition of health literacy which more directly incorporates expectations of the current health care system and the changing nature of the patient/clinician relationship. We note how the rapid expansion in the field of health literacy has influenced and expanded its definition and framework.

### **The Changing Definition of Literacy in the United States**

In early U.S. history, definitions and measurement of literacy were crude. Before the Civil War, an individuals' ability to sign his name on a legal document (rather than mark with an X) was an indication of literacy (Lockridge, 1974). In the mid 1800s through the mid 1930s, the U.S. Census Bureau merely asked individuals (white males initially) if they could read and write in any language. Using this approach, 20% of the population was deemed illiterate in the 1870s, but a century later (1979) only 0.6% of adults reported they could not read or write (Kaestle, Damon-Moore, Stedman, & Tinsley, 1991). Though inexactly measured, this trend indicated that complete illiteracy became rare in the United States.

In the twentieth century, more sophisticated definitions, conceptualizations, and measurement began to evolve in large part because military and labor experts were interested in determining what individuals needed to function on the job. The Civilian Conservation Corps coined the term "functional literacy," and defined it as having three or more years of schooling. For the next thirty years, literacy was defined in relation to increasing levels of school achievement, corresponding to the greater demands in the labor market and society overall. In the 1940s, a fourth grade education was considered the literacy level needed for various army jobs (Comings & Kirsch, 2005; Sticht, 1975). By the 1950s, the U.S. Census Bureau defined functional literacy as having at least a 6th grade education and by the 1960s, as part of the War on Poverty, the Department of Education set a national standard of functional literacy as an 8th grade education and expanded adult basic education programs to help achieve that goal (Kirsch & Jungeblut, 1986). In the late 1970s, it was thought that individuals needed at least a high school diploma (Kaestle et al., 1991). Today, postsecondary training is often considered necessary for individuals to compete in the labor market (Snow & Biancarosa, 2003; Spellings, 2006).

Public policy was influenced in the 1980s by publication of "Toward a Literate Society," a report by reading researchers Carroll and Chall which stated that, while illiteracy levels were declining, many individuals in the U.S. continued to have severe reading problems. Low literacy was identified as a national policy concern that would limit our economic, social, and defense competitiveness and "risk the very security of the nation" (Kaestle et al., 1991). This National Academy of Education report stated that any national program to improve literacy needed accurate and detailed data about the number of individuals with limited skills, the severity of their problems and their sociodemographic characteristics (Carroll & Chall, 1975; Kirsch

et al., 1993). Subsequent Congressional hearings found it difficult to examine the magnitude of the problem or trends because of inconsistencies in the ways literacy was defined and measured. In 1988, Congress asked the Department of Education to define literacy and address the need for information on the nature and extent of adult literacy. The resulting National Literacy Act defined literacy in 1991 as “an individual’s ability to read, write and speak in English, and compute and solve problems at a level of proficiency necessary to function on the job and in society, to achieve one’s goals, and develop one’s knowledge and potential” (Kirsch et al., 1993).

Accompanying increasing attention to defining and improving literacy was a focus on population measurement. While testing of children focused on achievement in school (Kaestle et al., 1991; Snow, 2003), testing of adults was conceptualized as functional literacy or skills practiced outside of schools to accomplish practical tasks in work, leisure and citizenship (Kaestle et al., 1991). The more expansive concept of functional competency goes beyond basic functional literacy and includes higher order cognitive activities such as information processing, working memory, problem solving and quantitative skills (Kaestle et al., 1991; Kirsch & Jungeblut, 1986).

The first major efforts to measure literacy in the adult population focused on real world tasks but were limited to particular segments of the population. The Department of Education’s 1985 National Assessment of Educational Progress (NAEP) tested young adults 21 to 25 years of age (Kirsch & Jungeblut, 1986) and in 1990, the Department of Labor commissioned the Literacy Proficiencies of Job Seekers (Kirsch et al., 1993). Finally, the Department of Education commissioned the 1993 National Adult Literacy Survey (NALS) to assess the breadth and depth of adult literacy in the entire population (Kirsh et al., 1993; Committee on Performance Levels for Adult Literacy, 2005). Based on the results of the previous two tests, literacy was viewed as an ordered set of skills and was characterized into three domains: prose, document, and quantitative skills. The results indicated that 21–23% of the adult population was in the lowest of 5 literacy levels and another 25–28% was in Level 2; the related conclusion that 90 million Americans lacked adequate literacy skills received widespread media attention.

The Department of Education’s subsequent 2003 National Assessment of Adult Literacy Survey (NAAL) was commissioned in part to identify how many individuals had “below basic skills” and needed basic adult education (Kutner et al., 2007). At the request of *Healthy People 2010* and health services researchers, health items were included the survey. The NAAL was the first large scale national literacy assessment to contain a component specifically designed to measure health literacy in U.S. adults (Kutner et al., 2007). An oral reading fluency section was added to better understand reading difficulty and a supplement was designed for adults with very low literacy to gather information on how they understood and navigated literacy and health literacy demands in their daily lives (Baer et al., 2009). Health tasks were characterized into three types: clinical, preventive and navigation of the health system. Scores were divided into four categories: below basic, basic, intermediate and proficient. Results of the three literacy scales differed slightly from the health literacy scale; 12–33% scored below basic and 22–33% scored in the basic category on the three functional literacy scales, compared to 14% scoring below basic and 22% scoring in the basic category on the health literacy scale. Several key conceptual features of literacy were found to affect performance on any given literacy or health literacy task: the task demand, test characteristic and the individual’s skill (White, 2010).

This brief history of literacy in the United States aligns with the country's shift from an agricultural to an industrial economy and now to an information-based economy. The definitions and measurement of literacy have also changed, becoming more representative of the skills needed to function successfully in the current society. In the last twenty years, the relationship between low literacy, health status and health outcomes have been documented (Berkman et al., 2004; IOM, 2004). This growing body of research has led to the formation of a new field of study referred to as *health literacy*.

## The Origins of the Conceptualization of Health Literacy

### *Multiple Definitions of Health Literacy*

As a relatively new construct, the definition of health literacy is evolving and has not been consistently applied (Berkman et al., 2004). Because individuals with similar educational attainment can differ substantially in their reading and mathematical skills, educational attainment was recognized as an inconsistent indicator of skill level (Berkman et al., 2004; Kirsch et al., 1993; Kutner et al., 2007). Thus, it can be an inaccurate proxy measure of individuals' baseline skills when evaluating differences in health outcomes or the effectiveness of health related interventions. This recognition led to an appreciation for the need to more directly conceptualize health related literacy.

Reaching a consensus on a definition of health literacy is complicated by the multiple skill categories and applications that are increasingly identified as necessary to be "literate" in relation to one's health. Table 1 presents a summary of definitions of health literacy found in the literature. While an early definition focused on the ability to apply basic reading and mathematical (numeracy) skills in a health care context (AMA Ad Hoc Committee, 1999), a widely cited subsequent definition focuses on the *goals* of being health literate, "the capacity to obtain, process, and understand" in a health related context, rather than the specific skills required to achieve those goals (Ratzan and Parker, 2000). Several later definitions, with varying levels of specificity, detail a constellation of abilities that would be needed for an individual to be health literate; these include, in addition to literacy and numeracy, rhetorical discourse (effective speaking, listening, and writing), the ability to use technology (particularly the Web), motivation, cognitive ability, and networking and social skills (Nutbeam 2006; Bernhardt, Brownfield, & Parker, 2005).

Further distinctions across definitions include differences in several important domains including whether the focus is on the individual or at a broader level, and whether health literacy level is considered static or can be expected to change over time through experience, and changes in the health care system and society, including changes in technology. We discuss these issues in greater detail below.

### *Is Health Literacy an Individual or a Broader Construct?*

Health literacy is commonly considered an *individual-level* construct and refers to a person's ability or capacity (see Table 1). Some definitions imply, while others specifically refer to specific skills an individual would need to perform health care related tasks. Across definitions, outcomes are related to the health of the individual, but vary in nuance, e.g., making health decisions, functioning in the health care environment, or promoting and maintaining good health. A recent definition of

**Table 1.** Various definitions of health literacy

Definitions	Source
Individual static definitions	
The constellation of skills, including the ability to perform basic reading and numerical tasks required to function in the health care environment, such as the ability to read and comprehend prescription bottles, appointment slips, and other essential health-related materials.	AMA Ad Hoc Committee on Health Literacy (1999)
The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.	Ratzan & Parker (2000), in Institute of Medicine (2004) and <i>Healthy People 2010</i> , DHHS (2000)
The capacity of individuals to obtain, process, and understand the basic information and services needed to make appropriate health decisions. Lee et al. (2004) note that moderators of health literacy include disease and self-care knowledge, health risk behavior, preventive health, and physician visits, and compliance with medications. Social support is a moderator for the relationship of health literacy with health status and health service use.	Selden, Zorn, Ratzan, & Parker (2000) in Lee, Arozullah, & Cho (2004)
The cognitive and social skills that determine the motivation and ability of individuals to gain access to, understand, and use information in ways that promote and maintain good health. Ratzan (2001) conceptualizes health literacy as a framework for health promotion activities and a link between knowledge and practice.	Nutbeam (2000) in Ratzan (2001)
Personal, cognitive, and social skills that determine the ability of individuals to gain access to, understand, and use information to promote and maintain good health. These include such outcomes as improved knowledge and understanding of health determinants, and changed attitudes and motivations	Nutbeam (2006)

(Continued)

**Table 1.** Continued

Definitions	Source
<p>in relation to health behavior, as well as improved self-sufficiency in relation to defined tasks. Typically these are outcomes related to health education activities. Health literacy is conceptualized as one domain in a conceptual model of health promotion.</p> <p>An individual-level construct composed of a combination of attributes that can explain and predict one's ability to access, understand, and apply health information in a manner necessary to successfully function in daily life and within the health care system.</p> <p>Functional health literacy: the skills and ability to successfully function and successfully complete health related tasks. Individual-level attributes include abilities in prose, document, and quantitative literacy; ability to engage in two-way communication; skills in media literacy and computer literacy; motivation to receive health information; and freedom from impairments and/or communicative assistance from others.</p>	Bernhardt, Brownfield, & Parker in Schwartzberg et al. (Ed.) (2005)
<p>Health numeracy is the degree to which individuals have the capacity to access, process, interpret, communicate, and act on numerical, quantitative, graphical, biostatistic, and probabilistic health information needed to make effective health decisions. Health numeracy is considered to be not simply about understanding (processing and interpreting), but also about functioning (communicating and acting) on numeric concepts in terms of health.</p>	Goldbeck, Ahlers-Schmidt, Paschal, & Dismuke (2005)
<p>The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions.</p>	McCormack (personal communication, 2010)

(Continued)

**Table 1.** Continued

Definitions	Source
Individual dynamic definition	
The wide range of skills and competencies that people develop to seek out, comprehend, evaluate, and use health information and concepts to make informed choices, reduce health risks, and increase quality of life.	Zarcadoolas (2005)
Varies by context and setting and is not necessarily related to years of education or general reading ability.	The National Network of Libraries of Medicine (2009)
Individual/system definition	
The ability to function in the health care environment and depends on characteristics of both the individual and the health care system. An individual's health literacy is context specific (dynamic) and may vary depending upon the medical problem being treated, the health care provider, and the system providing care. The definition includes health knowledge.	Baker (2006)
Dependent on individual and system factors, including communication skills of lay persons and professionals, lay and professional knowledge of health topics, culture, the demands of the healthcare and public health systems, and the demands of the situation/context.	<i>Healthy People 2010</i>
Public health definition	
Public health literacy is the degree to which individuals and groups can obtain, process, understand, evaluate, and act upon information needed to make public health decisions that benefit the community.	Freedman, Bess, Tucker, et al. (2009)

health literacy expands the emphasis beyond individuals to also include groups. Termed “public health literacy” this conceptualization concerns the knowledge, skills and engagement that groups of individuals have to address the public health of their community (Freedman et al., 2009). Public health literacy is complementary to individual health literacy and outcomes include a community’s understanding of public health messages as well as having the skills to evaluate and participate in civic action related to health care issues.

### *A New Definition of Health Literacy*

The Ratzan and Parker (2000) definition that was included in the Institute of Medicine (IOM) report *Health Literacy: A Prescription to End Confusion* (2004) and *Healthy People 2010* has been widely used. They define health literacy as being, “The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.” Based on a review of the definitions found in the literature (Table 1) and consultation with an expert panel, we offer some suggestions for minor modifications to the definition: *The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions.*

We substituted the phrase “have the capacity to” to “can” to emphasize that we are measuring “know how” or ability that can be put to use. This more clearly separates health literacy from intelligence. We added the skill “communicate about” to obtain, process, and understand health-related information since we consider oral communication skills (listening and speaking) to be a critical component of health literacy. We eliminated the term “basic” in relation to the health information needed to make decisions. Each health care decision requires using a different quantity and complexity of information. Limiting the expectation of the health information and services individuals have the capacity to use to “basic” may be misconstrued as there being a ceiling on the difficulty of decisions. As stated in *Healthy People 2010*, health literacy is not simply a function of basic literacy skills, but is “dependent on individual and system factors, including communication skills of lay persons and professionals, lay and professional knowledge of health topics, culture, the demands of the healthcare and public health systems, and the demands of the situation/context.” Also, the term “basic” focuses attention in the definition on distinguishing between low and a higher level of health literacy, which is better left to measurement.

We eliminated health services from the definition because health-related information encompasses information about services. We substituted the word “informed” for “appropriate.” Cultural background may influence the manner in which individuals interact with the health care system, clinicians, as well as their health related goals. The term “appropriate” risks being misinterpreted to mean that there is one best decision for a particular person or situation.

### *The Influence of the Health Care System on the Definition of Health Literacy*

Some definitions characterize health literacy as a product of both an individual’s capabilities and the demands of the health care system (Baker, 2006; U.S. Department of Health and Human Services, 2000). At issue is whether individuals’ level of health literacy would be considered higher or lower based on variation in the complexity of the information they encounter. One could argue that the population’s health literacy would be higher if health-related materials and communication more universally integrated principals of clear language, making them easier to understand and a closer match to individuals’ skill level.

Definitions of health literacy have begun to embrace a more ecologically framed conceptual model with an appreciation for the role of language, culture, and social capital (Zarcadoolas, Pleasant, & Greer, 2006; Nutbeam, 2008). This more robust perspective should also recognize the role that health information technology is

beginning to play in society and the need for considering the ability to use this technology as a component of health literacy skills. Technology will continue to impact both our understanding and measurement of literacy and health literacy, as it increasingly becomes an accepted mode for communicating health information. We agree that an ecologically framed perspective is appropriate and useful; however, we believe that caution is warranted to ensure that the conceptualization of health literacy does not become immeasurable and blur with other concepts, such as patient-centered communication.

### ***Is Being Health Literate Static or Dynamic?***

Whether health literacy is considered a fixed or dynamic concept will impact not only its definition but its measurement as well. Consistent with a definition of literacy more generally, an individual's *health literacy* would be considered relatively fixed. People can improve their literacy skills only through intensive interventions such as adult education classes so that generally an individual's literacy level would not be likely to change markedly in adulthood, absent such interventions. Corresponding to this conceptualization, an individual's health literacy level would generally only need to be measured once. However, some experts consider health literacy to be dynamic. Zarcadoolas et al. (2005) state that health literacy is "the wide range of skills . . . that people *develop* to use health information." This implies that individuals' health literacy can change as they gain experience with the various health circumstances and choices that they face and therefore their health literacy level would need to be measured and reevaluated repeatedly. We believe that conceptualizing health literacy as dynamic is inevitable. Viewing health literacy as static was primarily an artifact of its origins in prose literacy ability and related to limitations in existing measurement tools. We expect future movement to be toward the dynamic viewpoint, corresponding to increased sophistication in the field.

### ***Is There One Correct Definition?***

Through our review, we have gained a greater appreciation for the complex nature of the construct of health literacy. It can be viewed using a variety of lenses, resulting in a differently nuanced interpretation. In the end, the definition of health literacy that one selects may depend on one's goals.

## **Measuring Health Literacy**

The development of instruments that go beyond static measures of literacy and numeracy has lagged behind the attention more recently paid to defining and conceptualizing health literacy. A few instruments have been commonly used in studies to directly measure an individual's literacy or health literacy in relation to health outcomes. These include the Rapid Estimate of Adult Literacy in Medicine (REALM) (Davis et al., 1993) and the Test of Functional Health Literacy in Adults (TOFHLA) (Parker et al., 1995). The REALM and the TOFHLA focus primarily on reading-related skills (Berkman et al., 2004) and thus, are not considered comprehensive measures of the skills needed by individuals in the health care environment. The National Assessment of Adult Literacy (NAAL) is considered the most comprehensive tool; however, it is not publically available and thus cannot be used

in research or intervention studies. It seems that health literacy has been in large part limited by progress in developing measurement tools, more so than definitions and conceptualizations.

## Conclusions

The terms “literacy” and “health literacy” have been defined, refined, and measured in a variety of ways over the years, responding to changing demands in an increasingly complex society. During the recent period of growing interest in health literacy as an integral component of health communication, advancements have been made in defining the term. Lack of consensus about the definition of health literacy could potentially handicap progress in its measurement or delay solutions to significant problems. On the other hand, the range of definitions reflects an appreciation for the complexity of the construct, and the possibility that different definitions may be needed depending on one’s goals. The field of health literacy is growing rapidly, broadening to involve a larger and more interdisciplinary audience, and with that, there is a greater recognition of its complex and multifaceted nature.

## References

- Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association. (1999). Health literacy report of the Council on Scientific Affairs. *Journal of the American Medical Association*, 281, 552–557.
- Baer, J., Kutner, M., & Sabatini, J. (2009). *Basic reading skills and the literacy of America's least literate adults: Results from the 2003 National Assessment of Adult Literacy (NAAL) Supplemental Studies* (NCES-2009-481). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics.
- Baker, D. (2006). The meaning and measure of health literacy. *Journal of General Internal Medicine*, 21, 878–883.
- Berkman, N. D., DeWalt, D. A., Pignone, M. P., Sheridan, S. L., Lohr, K. N., Lux, L., et al. (2004). *Literacy and health outcomes. Evidence report/technology assessment No. 87* (AHRQ Publication No.04-E007-2). Rockville, MD: Agency for Healthcare Research and Quality.
- Carroll, J. B., & Chall, J. S. (1975). *Toward a literate society*. New York: McGraw-Hill.
- Comings, J., & Kirsch, I. (2005). Literacy skills of US adults. In J. G. Schwartzberg, J. B. VanGeest, & C. C. Wang (Eds.), *Understanding health literacy: Implications for medicine and public health* (pp. 43–53). Chicago: American Medical Association Press.
- Committee on Performance Levels for Adult Literacy. (2005). *Measuring literacy. Performance levels for adults*. Washington, DC: The National Academies Press.
- Davis, T. C., Lon, S. W., Jackson, R. H., Mayeaux, E. J., George, R. B., Murphy, P. W., & Crouch, M. A. (1993). Rapid estimate of adult literacy in medicine: A shortened screening instrument. *Family Medicine*, 25(6), 391–395.
- Freedman, D. A., Bess, K. D., Tucker, H. A., Boyd, D. L., Tuchman, A. M., & Wallston, K. A. (2009). Public health literacy defined. *American Journal of Preventive Medicine*, 36(5), 446–451.
- Golbeck, A. L., Ahlers-Schmidt, C. R., Paschal, A. M., & Dismuke, S. E. (2005). A definition and operational framework for health literacy. *American Journal of Preventive Medicine*, 29(4), 375–376.
- Institute of Medicine. (2004). *Health literacy: A prescription to end confusion*. Washington, DC: The National Academy Press. Washington, DC. <http://www.iom.edu/Reports/2004/Health-Literacy-A-Prescription-to-End-Confusion.aspx>

- Institute of Medicine. (2009). *Measures of health literacy: Workshop summary*. Washington, DC: The National Academy Press. <http://www.iom.edu/Reports/2009/Measures-of-Health-Literacy.aspx>
- Kaestle, C. F., Damon-Moore, H., Stedman, L. C., & Tinsley, K. (1991). *Literacy in the United States*. New Haven, CT: Yale University Press.
- Kirsch, I., & Jungeblut, A. (1986). *Literacy: Profiles of America's young adults*. Princeton, NJ: Educational Testing Service.
- Kirsch, I., Jungeblut, A., Jenkins, L., & Kolstad, A. (1993, September). *Adult literacy in America: A first look at the results of the National Adult Literacy Survey*. Washington, DC: National Center for Education Statistics, U.S. Department of Education.
- Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy* (NCES 2006-483). Washington, DC: National Center for Education Statistics.
- Kutner, M., Greenberg, E., Jin, Y., et al. (2007). *Literacy in everyday life: Results from 2003 National Assessment of Adult Literacy*. Washington, DC: U.S. Department of Education.
- Lee, S. Y. D., Arozullah, A. M., & Cho, Y. I. (2004). Health literacy, social support, & health: A research agenda. *Social Science and Medicine*, 58, 1309–1321.
- Lockridge, K. A. (1974). *Literacy in colonial New England: An enquiry into the social context of literacy in the early modern West* (1st ed.). New York: W. W. Norton & Company.
- National Network of Libraries of Medicine. (2009). *Health literacy*. <http://nnlm.gov/outreach/consumer/hlthlit.html>
- Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science and Medicine*, 67(12), 2072–2078.
- Nutbeam, D., & Bauman, A. (2006). *Evaluation in a nutshell: A practical guide to the evaluation of health promotion programs*. New York: McGraw-Hill.
- Parker, R. M., Baker, D. W., Williams, M. V., & Nurss, J. R. (1995). The test of functional health literacy in adults: A new instrument for measuring patients' literacy skills. *Journal of General Internal Medicine*, 10, 537–541.
- Ratzan, S. C. (2001). Health literacy: Communication for the public good. *Health Promotion International*, 16, 207–214.
- Schwartzberg, J. G. (Ed.). (2005). *Understanding health literacy: Implications for medicine and public health*. Chicago: American Medical Association Press.
- Snow, C., & Biancarosa, G. (2003). *Adolescent literacy and the achievement gap: What do we know and where do we go from here?* New York: Carnegie Corporation of New York.
- Spellings, M. A. (2006). *Test of leadership: Charting the future of U.S. higher education*. Jessup, MD: U.S. Department of Education—Education Publications Center.
- Sticht, T. (Ed.). (1975). *Reading for working: A functional literacy anthology*. Alexandria, VA: Human Resources Research Organization.
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010* (2nd ed.). Washington, DC: Department of Health and Human Services, National Networks of Libraries of Medicine.
- White, S. (2010). *Understanding functional literacy: Connecting text features, task demands, respondent skills*. New York: Routledge.
- Wide Range Inc. (1993). *Wide Range Achievement Test (WRAT 3)*. Wilmington, DE: Wide Range Inc.
- Zarcadoolas, C., Pleasant, A., & Greer, D. (2005). Understanding health literacy: An expanded model. *Health Promotion International*, 20(2), 195–203.
- Zarcadoolas, C., Pleasant, A., & Greer, D. (2006). *Advancing health literacy*. San Francisco: Jossey-Bass.