Reading Assessment

LINKING LANGUAGE, LITERACY, AND COGNITION

Melissa Lee Farrall

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
Published simultaneously in Canada.

Library of Congress Cataloging-in-Publication Data:
Farrall, Melissa Lee.
Reading assessment : linking language, literacy, and cognition/Melissa Lee Farrall, PhD.
pages cm
Includes bibliographical references and index.
ISBN 978-0-470-87393-9 (pbk.)
978-1-118-28379-0 (e-bk.)
978-1-118-28201-4 (e-bk.)
978-1-118-2854208 (e-bk.)
1. Reading—Ability testing. 2. Educational tests and measurements. 3. Reading, Psychology of. 4. Cognition in children. I. Title.
LB1050.46.F39 2012
372.48—dc23

2011047225

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

This book is dedicated to the men in my life:
To my husband, Bob
To my sons, Nolan and Lucas
And to my friend and mentor, John O. Willis

Contents

Acknowledgments

This book has been the result of over three years of work, and during that time I have had the help and support of several individuals. (All mistakes, of course, are mine.) My assistant, Debby Mullan, has been invaluable for her fastidiousness, attention to detail, and never-failing encouragement; I am often struck by her expertise on teaching reading and her comments on the importance of explicit instruction. Susan E. Morbey, an astute evaluator who writes and teaches with great intelligence, critiqued each and every chapter. I smile when I think of moments stolen from conversations with our spouses so that we could talk of testing and cognition.

Caryl Patten, special education advocate, read with a critical eye offering expertise in the history of dyslexia. ''Tell them,'' she said, ''that Samuel Orton was right.'' My husband, Bob Barrie, has read every single page of this text. He knows more about assessment than most software professionals would ever think possible or imagine. To his surprise and my delight, he thinks differently now about language and reading.

The staff at Wiley made this process a pleasure. Marquita Flemming, Sherry Wasserman, Kim Nir, and Isabel Pratt displayed endless understanding and patience. Jason Zayas, artist extraordinaire, turned my thoughts into illustrations. I also wish to thank three unknown reviewers who helped me to shape the content of this book.

I have been fortunate in my life to have had a series of mentors who were kind enough to take me under their wing. David Maxwell, now president of Drake University, opened my eyes to the beauty of the Russian language and 19th-century Russian literature, a period of literary genius that has no equal in history. Robert Mathiesen, Professor Emeritus of Brown University, trained me to analyze scribal errors in Old Russian manuscripts for what they could tell us about the Slavs prior to the time of the printing press. Little did I know that I would use those skills in my work in the field of learning disabilities.

The late Sara Brody of Rivier College taught me my first graduate course on reading; she was a fierce advocate for reading instruction, and it was in her class that I first learned about phonological awareness. Elaine Holden, a fellow in the Academy of Orton Gillingham Practitioners and Educators, accompanied me on a 10-year journey working with children with severe reading disabilities. Jane Ashby, a researcher at Central Michigan University, escorted me into the world of eye movements and the neurobiology of language. I am in such awe of her work and what it means to the teaching of reading. I also wish to thank my students who have made me think deeply about reading and assessment. Abigail Baker, special education teacher, deserves a special note of appropriation for granting me permission to use her work.

Most of all, I am grateful to John O. Willis, the head of the Specialist in the Assessment of Intellectual Functioning (SAIF) Program at Rivier College. Dr. Willis, always the consummate professional, advisor, and friend, has generously given of his time and resources to help me become a better evaluator, teacher trainer, and author. His knowledge and insight have helped me to appreciate the responsibility inherent in every evaluation. His humor just made it all fun.

I was lucky. My childhood was filled with trips to the library and books from murder mysteries to high-energy physics. Mom and Dad, look what I did.

Introduction

Chapter 1

Joseph Brodsky (1940–1996), winner of the 1987 Nobel Prize for Literature and the 1986 National Book Award, became poet laureate of the Library of Congress in 1991. Brodsky, a former Soviet citizen, had been sentenced to hard labor in Siberia in 1964 for ''social parasitism'' and ''decadent poetry.'' Upon his exile from the Soviet Union in 1972, he emigrated to the United States where he became a citizen.

Brodsky never could understand the apathy of Americans toward poetry. His quote, ''I don't know what's worse, burning books or not reading them'' (Ohnemus, 1991, p. 9) expressed his sheer puzzlement over American reading habits. Brodsky believed that literature, in particular poetry, was essential to a culture and that the downfall of the Soviet Union was a result of its efforts to censor its writers and poets. According to Brodsky, empires did not stand by virtue of their legions, they were united by their language (Billington, 1996). The Soviet Union was destined to fall because it denied its linguistic and literary heritage.

As poet laureate in the United States, Brodsky recommended that inexpensive anthologies be made available to the public in places such as hotels, airports, and even supermarkets in the hope that they would become a source of inspiration for those who were lonely, in fear, or spiritually in need. Brodsky made this recommendation with a sense of urgency. In what was an amazingly prescient statement, Brodsky said that ''there is now an opportunity to turn the nation into an enlightened democracy . . . before literacy gets replaced with videocy'' (Ohnemus, 1991, p. 9).

Brodsky would have been sorely pained to read the National Endowment for the Arts report, *To Read or Not to Read: A Question of National Consequence*, published in 2007. This study presented a somber picture of American literary habits; from 1985 to 2005, American spending on books dropped 14%. Americans in almost every demographic group were reading less than their predecessors 10 and 20 years ago, and as they aged they read less and less. According to this study, almost half of Americans between the ages of 18 to 24 did not read for pleasure; only 67% of college graduates read voluntarily, a decline of 15 percentage points over the past 20 years.

The statistics from 2007 are grim: Most individuals ages 15 to 24 are spending only 7 to 10 minutes per day reading voluntarily. This does not mean, however, that these readers are focused and engaged in what they are doing. Fifty-eight percent of middle and high school students are

multitasking with electronic media at the same time that they read.

Educators in the United States are now faced with the immense task of working with a population that is increasingly diverse and that has other forms of stimulation competing for its attention and time. In addition to reading less, Americans are reading less well. Although the National Assessment for Educational Progress scores for 2009 represented a slight increase from 2005, the average reading scores for 17-year-olds were less than the scores earned in 1992 (National Center for Education Statistics, 2010). As interest and skill in reading decline, we have access to more information in print than ever before. We must ask whether we can realize our potential as a nation if we do not read and think deeply about what ails us.

As educators, we are faced with building a workforce from a population that is increasingly diverse in terms of ethnicity, culture, socioeconomic status, and preparedness for learning. While our task may seem to be awe inspiring (and there is not an educator who goes home at night unexhausted), we have a growing body of research on what it takes to turn children into readers. This research, however, does not always make it into training programs for educators where research-based methodologies are often presented as an instructional alternative: ''You can do this or you can do that.''

It is not unusual for teacher training programs to produce a variety of specialists who are each expert within their own domain. We have regular education teachers, special educators, speech and language pathologists, and psychologists (just to name a few) who each claim (or relinquish) responsibility for their own piece of a child's education. It is not possible, however, to separate out language from reading, and we do our children a disservice when we attempt to offer piecemeal solutions that, as J. O. Willis, head of the Specialist in the Assessment of Intellectual Functioning Program at Rivier College, has said, are then integrated with a staple (personal communication, January 14, 2005). Findings must be integrated thoughtfully with comprehensive conclusions and recommendations. Although on the surface children with poor reading comprehension may all look the same, they have different strengths and weaknesses. Each child requires instruction that is designed to meet his or her unique needs as a learner and that is delivered in a timely fashion. This is where evaluators come in.

A Field Under Assault

The field of assessment is currently under assault. Evaluations are considered costly in terms of time and resources. Some say that evaluations are irrelevant and that the dissection of strengths and weaknesses does little to inform instruction (D. Fuchs, Fuchs, Mathes, Lipsey, & Roberts, 2001). Much of the criticism may be well deserved. In some cases, evaluations are not comprehensive; in other cases, evaluations may stop short of being helpful. Excessive use of jargon, seemingly contradictory results, recommendations for the same old same old . . . No wonder teachers have been known to complain ''I would rather have a tooth extracted than attend another evaluation team meeting.''

When I first became a learning disabilities specialist with a resource room of my own, I had tested all of two children. I knew little about tests as products, and I had no experience in linking recommendations to research-based practices. In fact, I was encouraged during my training to focus more on modifications and accommodations than on reading remediation. To this day I see evaluations that conclude with recommendations for additional time without considering the root cause of the problem—that is, the inability to read. As a trainer who works with teachers at the graduate level, I see many educators who have not been taught about the role of language in reading or about the instruments that they use to test children.

Integrated Approach

This text is presented as an integrated approach to reading assessment; it is intended as a graduate-level text in a reading assessment or general

assessment course. Evaluators who wish to assess reading skill require expertise not only in statistics, test development, test administration, and the precepts of good report writing; they also require expertise in how reading develops and in the complexities of reading comprehension. In particular, evaluators require a knowledge of the structure of language, for language is the stuff from which print is made.

In the past, component approaches to reading assessment have been criticized. By dissecting reading and language skills into discrete units, some believe that we lose sight of the big picture—the interaction that occurs between the reader and the text. Language, however, is remarkable for its connectivity. Vocabulary development is related to phonemic awareness and to syntax. Spelling is related to vocabulary. Expressive language skills are related to written expression, and receptive language is related to reading comprehension. While we may seek to measure discrete abilities, we need to think about language as a system and peel the onion one layer at a time.

The Text

Each chapter begins with a review of the theory and then moves into a discussion of issues related to assessment and the tools of the trade. Inclusion of specific test instruments is not necessarily a recommendation for use; sometimes tests are discussed because they have much to offer the field of assessment. In other cases, tests are discussed to illustrate weaknesses and potential problems in interpretation. Many chapters include case studies; all chapters include review questions that are designed to provide opportunities for basic skill development, critical thinking, and what it all means for a living, breathing child.

Chapter 2 begins with a review of reading theory and the stages of reading acquisition. How we define ourselves as educators and the controversies associated with reading reflect, at the most basic level, the difficulty associated with trying to understand how humans think and what the mind does in its efforts to process print and make meaning.

Chapter 3 focuses on theories of how children acquire language, the stages of language development, and a brief discussion of communication disorders. A knowledge of the structure of language permits us to understand both typical and atypical language development as a foundation for success in the classroom and for understanding print—written language that has been stripped of its prosody and potential for clarification.

Chapter 4 examines the issues associated with the assessment and instruction of children who are linguistically and culturally diverse. The process by which students with limited English proficiency and culturally diverse backgrounds are identified for special education is fraught by confusion over second language acquisition and actual language disorders. What does it mean to assess phonemic awareness in an English-language learner (ELL)? Are delays in decoding a function of ELL status, or are they indicative of a more serious problem with print? Why is it that children who appear to be proficient conversationally struggle with reading comprehension? How can we be proactive in our assessment and, at the same time, respect the linguistic and cultural differences that make us rich as a nation?

Chapter 5 on statistics and test development moves us into the realm of criterion-referenced and norm-referenced tests. Experienced evaluators may find some of this content familiar; novices in the field will find discussions of mastery, norm-referenced tests, and scoring systems as well as reliability and validity. This chapter also addresses concerns regarding measuring progress, floor and ceiling effects, and age and grade equivalents. In the assessment marketplace, it is consumer beware.

Chapter 6 focuses on test administration and report writing. A top-down approach to testing helps ensure that we use our time as evaluators well and that we do not subject children to more tests than are required. A template provides a skeleton for report writing that permits us to work efficiently, reduce the potential for errors, and at the same time produce a report that is highly

individualized. Of course, the communication of test results in a manner that can be understood by parents and other educators is paramount to this discussion.

Chapter 7 brings us to progress monitoring and its potential for responding to children's need with greater efficiency. As a profession, we like the practicality of counting whatever is deemed countable. It is easy to do and easy to score, and there are many benefits to monitoring children's response to instruction. Unfortunately, not everything that is important is countable, and progress monitoring may not answer all questions regarding a child's need for instruction. Perhaps we should be thinking of what progress monitoring and comprehensive evaluations together have to offer.

Chapter 8 focuses on intellectual assessment and the relationship between intellectual ability and academic achievement. It would be a shame to assess reading without understanding what the field of cognition can tell us about how children learn. While we may not be partial to the discrepancy method for identifying learning disabilities, cognitive assessment can tell us much about verbal knowledge, spatial thinking, memory, and processing speed. In some cases intellectual assessment helps us understand why children do the things they do.

Chapter 9 examines oral language assessment with the goal of satisfying the hidden language specialist that resides deep within those of us in the field of reading. In particular, we look at the relationship between listening comprehension and reading comprehension, and the different ways in which they can be assessed. We also study the respective roles of vocabulary, syntax, abstract and figurative language, and inferential thinking, and how each skill relates to reading. I continue to be amazed by the all-important role that vocabulary plays not just in comprehension but also in decoding.

Chapter 10 delves into the underlying processes (and their associated controversies) that support the development of decoding and spelling: phonemic awareness, phonological memory, rapid naming, and orthographic processing. The chapter begins with a discussion of dyslexia and what it is about phonological processing that makes it hard for some children to perceive speech sounds and learn to read. We look how phonemic awareness develops and what to do with the myriad of tests that each purport to measure these all important skills. This chapter examines rapid automatized naming, an underlying process that is often overlooked in reading assessments, together with new tests that are forging into the less understood (and less researched) area of orthographic processing.

Chapter 11, the longest chapter in this text, reviews what current research and technology have to say about the dual route model, word recognition, and word attack, culminating in a discussion of reading fluency. As part of our exploration of print-based skills, we examine the usefulness of print awareness and alphabet skills as predictors of reading as well as issues (and yes, the debate) related to the assessment of noncontextual word reading. Terminology and concepts related to phonics are explained as vehicles for error analysis and communication with parents and other educators. The chapter concludes with a discussion of eye movements, reading automaticity and fluency, and the different ways in which they are assessed.

Chapter 12 discusses the Kintsch Model of Reading Comprehension, inferential thinking, working memory, background knowledge, and vocabulary. In this chapter we review different types of comprehension tests and issues related to how reading comprehension is conceptualized. Are we measuring a child's ability to learn new content from a passage, or are we measuring the sum total of passage content and a child's background knowledge? Is it possible to tell the difference? Given that different tests of reading comprehension may provide dramatically different results for the same child, this chapter provides a critical look at what tests actually measure and what they do not.

Chapter 13 strays from the arena of formal assessment to informal reading inventories (IRIs),

and it discusses whether IRIs are really standardized tests in disguise. We examine the history and debate associated with reading levels, what the research has to say about miscue analysis and errors, and the use of running records. In the end, this chapter closes with a discussion of readability and of the many factors that make texts easy or hard to understand.

Chapter 14 shifts away from reading per se to a discussion of written expression and spelling, skills that are often overlooked in the field of reading. While you might be tempted to say ''rightly so,'' most children with reading challenges struggle with writing, and most children with decoding challenges struggle with spelling. Given the importance of written expression and spelling as tools for enhancing reading and decoding, we would be remiss to ignore them. The assessment of written expression, however, is complicated by a fundamental lack of agreement as to what written expression is and how it should be measured. Each time we test writing skill, we have to be aware of the limitations and the strengths of the instruments that we are using.

This textbook concludes with a discussion of illiteracy in Chapter 15. As educators, we have to understand the burden that reading failure places on society, on the family, and on the individual.

Before we begin, you might wish to take the pretest presented next.

Survey of Knowledge: Assessment and Reading

1. What is the primary purpose of a norm-referenced, standardized test?
2. What does the term standard deviation describe?
3. When is a test considered to be reliable?
4. Johnny earned a standard score of 98 on the reading comprehension test when it was read to him. Explain why this score is not valid.
5. Johnny earned a standard score of 90 on the Anybody-Can-Do-It Reading Test in 2009; he earned a standard score of 85 on the same test in 2010. Explain to all concerned whether Johnny has made progress or whether his skills have declined. Presume a standard error of measure of ± 5.
6. What does it mean to have an insufficient floor?
7. What is the structure of language?
8. List the components of a comprehensive reading evaluation.
9. Why is it important to test reading fluency?
10. Identify the six syllable patterns.
11. List four different ways of testing reading comprehension.
12. What is dyslexia?
13. What is a double deficit?

Reading Theory and Stages of Reading Acquisition

Chapter 2

Introduction

For centuries humans have sought to explain the mystery of language and thought. What started as a discussion among theologians, philosophers, and poets has now moved into the domain of science, and for the past 100 years psychologists, educators, biologists, and neurologists have attempted to lift the veil from the brain and reveal what happens when the mind encounters print.

The long-standing debate over the nature of cognition in general and reading in particular has at its core the practical challenges associated with trying to measure an internal, unobservable mental activity (Johnston, 1983). Recent advances in the field of medical science notwithstanding, researchers and educators have been forced to rely on their powers of observation and a variety of tools (sometimes crude and imperfect) in order to define the nature of reading. How does one describe the interaction between author and reader? How do we ascertain the process by which children become readers and thinkers? Just what does it mean to read?

The word *read* has a variety of meanings. We read over a text to get a general impression or read through a text from beginning to end. We can read aloud or silently, we can read for the gist or deeply. Actors read for parts in plays; parents read their children to sleep. We can read off measurements from a data logging device, or we can read up on a subject and become more informed. We can read someone's mind or read between the lines. When we read into something, all does not bode well. When we read someone the riot act, we chastise them for their bad behavior.

The *Shorter Oxford English Dictionary* (Stevenson, 2007) lists 21 definitions for the verb *to read*. All definitions of the transitive verb involve the notion of interpreting, reasoning, and ''taking in the sense of'' (p. 2477). The word is thought to have come to Old English (rædαn) from Old Norse (rαðα) and Old High German (rαten), originally meaning ''to advise, plan, [or] contrive'' (p. 2477). The word *riddle* also derives from the Old English root, extending the usage to include guessing.

The link between reasoning and print is attributed to Old English and Old Norse. According to the *Shorter Oxford English Dictionary* (Stevenson, 2007), *read* means ''believe, think [or] suppose.'' The secondary definition is

> *inspect and silently interpret or say aloud (letters, words, sentences, etc.) by passing the eyes or fingers over written, printed, engraved, or embossed characters; render (written or printed matter) in speech esp.* aloud *or to another person (also with pers. indirect obj.), take in the sense of (a book*

or magazine), or habitually peruse (an author's writing, a newspaper, etc.) by inspecting and interpreting letters, words, sentences, etc. (p. 2477)

The dictionary definition, however, does not take into account that reading means different things to different people in different contexts at different stages of their lives. The English language does not provide us with multiple words for reading; the word describes a broad spectrum of behaviors ranging from the child who proudly recites what he has scribbled on the wall to the attorney who examines legal contracts. It does not distinguish between the child who is learning to sound out words and the student who reads with confidence, automaticity, and fluency.

Given that English has few terms with which to describe reading, we might think that English speakers have little interest in reading. In fact, the converse is true. The debate over reading has incited passion, fierce arguments, and deep-rooted concerns for how we nurture and teach our children.

In order to appreciate the present-day controversy over reading, it is helpful to understand the philosophical and psychological underpinnings that have contributed to our views of how children learn and how they become readers. This chapter reviews some of the major theories on cognition and language as they have contributed to current models of reading theory and the stages of reading development.

Philosophical Underpinnings: Nature Versus Nurture

The discussion over language and cognition encompasses a wide range of theories that span the spectrum from those who believe that we learn by virtue of our biology to those who believe that learning is shaped by experience. The nature versus nurture controversy, as it is frequently called, has its roots in the philosophical discussions of the late 17th century that attempted to reconcile the differences between the behaviors of children and those of adults.

John Locke

The English philosopher John Locke (1632–1704) was the first to suggest that children were not born with adult reasoning capabilities and that they were not miniature versions of their parents. In 1690 (1997), Locke published his *Essay Concerning Human Understanding* in which he described children's minds as blank slates (*tabula rasa*) to be imprinted and transformed through sensory experience. Three years later Locke published a treatise called *Some Thoughts Concerning Education* (1693, 2010). This work had a tremendous impact on 18th-century educational theory. It sought to deemphasize self-indulgent educational practices of the Renaissance and its spotlight on the arts and focus instead on the development of critical thinking skills, the sciences, and vocational training. Locke's call for educational reform reflected a comprehensive approach that addressed parental and pedagogical responsibilities in three main areas: health, virtue, and academics.

While we may be pleased to see this early concern for health and character as part of a child's education, Locke's view of childrearing practices would be regarded by many today as harsh and unforgiving. Locke believed that children would develop healthy bodies through rigorous exposure to the cold and harsh elements, an idea somewhat akin to environmental inoculation. Virtue, Locke believed, in contrast to early views of original sin, would come with self-denial and rational thinking. Physical rewards and punishment were discouraged; they would promote sensuality. Locke cautioned parents to limit their children's exposure to inappropriate or foolish ideas; such exposure would taint the blank slate, leading to malformation of character. Children would embark on a path to virtue and rationality in an environment where parents and teachers would model proper behaviors and thoughts. Childhood was not about children; it was about forming adult character.

Despite his strong feelings on what constituted a proper education, Locke never provided much detail regarding specifics of instruction. His views, however, transformed the way in which adults considered children, and his stance became the

foundation for the environmentalist position on learning and for the school of empiricism.

Jean-Jacques Rousseau

While many philosophers acknowledged the differences between adult and child thought, not everyone accepted the notion that learning was the sole product of experience. Jean-Jacques Rousseau (1712–1778), born in Geneva, was long considered the leading voice of the nature school of thought. He accepted Locke's view that children were not like adults. In contrast, however, Rousseau proposed that children were born with innate qualities that would develop and unfold according to a biological time table, culminating in a unique, virtuous adult. In his work *Emile: or, On Education* (1966, 1979), Rousseau proposed that children be encouraged to follow their natural curiosity and learn under the guidance of a tutor who would facilitate experiences, preferably in the country, free from the artifices of society.

Rousseau's view of education was child-centered. He was the first to argue for a developmentally appropriate education. Rousseau proposed that children advance through three stages to adulthood. The first stage was one of emotion and natural inclinations. Rousseau believed that children who were permitted to pursue these inclinations without the influence of potentially corrupting societal influences would enter into a stage of reasoning when they reached 12 years of age. During this second stage, adolescents would be provided with opportunities to problem-solve. Rousseau did not advocate instruction in the arts and sciences; he valued reasoning more than world knowledge. His work *Discourse on the Sciences and Arts* (1750, 1993), in fact, argued that these avocations were the product of vanity and self-interest and that they distracted young men from moral pursuits of friendship and love of country. The third and last stage (adulthood) would come at age 16; having internalized the tools of reason, adults would live a life of character and value.

Rousseau's views were not limited to child-rearing practices and education. His views of the innate morality of natural man, societal corruption, inequality, religion, and free will were both celebrated and reviled for their contribution to the French Revolution and early American political thought.

Empiricism and B. F. Skinner

The first half of the 20th century was influenced by the disciples of John Locke, who argued that science needed to be based on phenomenon that could be observed and measured. B. F. Skinner (1905–1990), recognized as the major proponent of empiricism in the United States, rejected the study of internal mental states in favor of an objective science based on behavioral principles. Skinner had no interest in psychological machinations; he equated the inner workings of the mind to an impenetrable black box that had little to offer the field of science. Instead, Skinner developed a theory of psychology that was based on observable behaviors and how those behaviors changed through reinforcement. In 1948 Skinner published *Walden Two*, a fictional account of a utopian community, in which individuals were supported to achieve their potential through environmental and social engineering. Although noble in its vision, *Walden Two* was met with suspicion and derision by a public fearing that individual freedom would be replaced by programmed robotic behavior.

In 1957 Skinner published *Verbal Behavior*, in which he reduced language, once thought to be divine in nature, to a behavior, like any other, that was shaped by the environment. According to Skinner, nature did not provide children with tools to learn language. Children acquired language because their early attempts at speech were modeled and reinforced. They learned how to sequence words into phrases and phrases into clauses through a process known in behavioral circles as chaining.

Skinner's effort to define all of the conditions under which speech was acquired was built on a foundation destined to crumble. His theory suggested that children could only produce language that was part of their experience; they could not state what they had not previously heard and learned. In his analysis, however, Skinner was

forced to acknowledge that verbal behaviors could occur without environmental stimuli and that speakers could reinforce their own behaviors through thinking. Skinner was skirting the surface of what was thought to be an impenetrable black box.

Skinner's legacy to teachers was not in the field of language; his major contribution to the field of teaching was in the area of operant conditioning and the idea that behaviors could be modified through positive and negative reinforcement. Much of Skinner's work was misunderstood by the public that was uneasy with the prospect of using research on rats and pigeons in special cages called Skinner boxes to learn about human behavior. Contrary to what circulated widely in the press, however, Skinner did not advocate an end to freedom, and he did not raise his daughter in a Skinner box. Deborah Skinner Buzan, Skinner's daughter, reported in 2004 that she was alive, that she loved her father, and that she was doing well.

Inside the Black Box

Although behaviorism reigned supreme in the field of experimental psychology in the United States, several distinguished psychologists were exploring the mind inside the black box (G. Miller, 2003). In the 1930s A. R. Luria (1902–1977), a Soviet developmental psychologist who worked under the direction of Lev Vygotsky, Soviet psychologist, researched the relationships among culture, language, and the development of higher-level thinking skills. In particular, Luria examined the effect of cultural development on populations lacking knowledge of writing or print, a large concern for the Stalinist government. He was also credited with the invention of the first lie detector and for his work in aphasia.

In France during the same period, Jean Piaget (1896–1980) was researching the qualitative differences in children's thought based on patterns of their responses on IQ tests that were designed for adults. It was Piaget who first understood that children's responses were not errors and that they reflected their perceptions of the world. In the 1940s Jerome Bruner, American psychologist, researched the ways in which internal ''mental sets'' affected perception and how experience and cultural forces affected an individual's world view. Bruner would eventually publish a seminal work, *The Process of Education* (1977), in which he spoke to the need for structure, motivation, and active involvement in learning. In contrast to Piaget, Bruner believed that cognitive development could be enhanced, and he decried the practice of delaying instruction until children were deemed ready.

Cognitive Revolution

Prior to the 1950s, structuralism reigned in the field of linguistics. Language was dissected and reassembled into a hierarchical structure: Phonemes were combined into morphemes, morphemes into sentences, and sentences into discourse. Researchers, however, were becoming frustrated; Structuralism did not provide insight into how children mastered the many complexities of language, and linguists were at a loss to describe just what constituted a sentence. At the time, there was no model that encompassed the infinite variation in sentences produced by humans.

Noam Chomsky

And then there was Noam Chomsky (1928–), a young professor at the Massachusetts Institute of Technology. With the publication of *Syntactic Structures* in 1957, Chomsky moved the study of language from nurture to nature and laid the foundation for whole language educators who decided that learning to read was as natural as learning to speak. He was also instrumental in redefining the science of cognition as a multifaceted discipline that would unite psychology, linguistics, and anthropology together with the new fields of computer science and neuroscience.

Chomsky's *Syntactic Structures* stood in stark contrast to the basic tenets of empiricism. According to George Miller (2003), American psychologist, Chomsky believed that ''defining psychology as the science of behavior was like defining physics as the science of meter reading'' (p. 142). The

same observation applied to language. Behaviorism could not do justice to the complexity of language and the sophistication of children's language skill. The coup de grace for the empiricist view of language acquisition occurred when N. Chomsky reviewed Skinner's *Verbal Behavior* in 1957. Chomsky, in contrast to Skinner's position that language was acquired through experience, proposed that children were born with a uniquely human predisposition for language and that their innate grasp of language structures exceeded the expertise of most teachers and caregivers. Because medical science was not sufficiently developed to identify the part or parts of the brain that were responsible for language, Chomsky developed a metaphor for innate language ability that became known as the Language Acquisition Device (LAD). Children did not learn language from adults; language was a product of biology.

Almost overnight, Chomsky's theories and the field of linguistics became the rage among scholars who sought to verify whether language indeed was uniquely human and whether language was a reflection of the neurostructures of the brain. In 1968 *Time* magazine reported in an article entitled ''Academic Disciplines; The Scholarly Dispute Over the Meaning of Linguistics'' that the field of linguistics had grown from an esoteric rarity to an option for undergraduates at over 30 universities. Linguists were in short supply; their task was immense. Their work would take them to the four corners of the earth as well as the animal kingdom in an effort to prove that all languages had fundamental features in common, that language was developmental, and that language was uniquely human.

Chomsky's views on language acquisition also extend to the classroom. Chomsky is a constructionist; he believes that the teacher's job is to arouse natural curiosity and provide students with opportunities to discover new content. In an interview in 1991, Chomsky stated, ''[T]hat's good teaching. It doesn't matter what you cover; it matters how much you develop the capacity to discover.'' When asked, however, about standard literary knowledge, Chomsky acknowledged the importance of ''sensible prescriptivism,'' stating:

> *I would certainly think that students ought to know the standard literary language with all its conventions, its absurdities, its artificial conventions, and so on because that's a real cultural system, and an important cultural system. They should certainly know it and be inside it and be able to use it freely . . . . Much of it is a violation of natural law. In fact, a good deal of what's taught is taught because it's wrong. You don't have to teach people their natural language because it grows in their minds, but if you want people to say, 'He and I were here' and not 'Him and me were here,' then you have to teach them. (G. Olson & Faigley, 1991, p. 30).*

Chomsky did not specifically address issues related to how children learn to read; this area he left to the expertise of his wife, Carol Chomsky, a respected researcher in language and psycholinguistics at Harvard University.

Jean Piaget

There is not a teacher in a classroom who does not, to some degree, view children and learning through Piaget's window. Piaget's views, in fact, are at the heart of the debate on how we teach and assess reading skill.

Jean Piaget (1896–1980) transformed Rousseau's stages of development and the notion of child-centered education into the leading theory of cognitive development of the 20th century. Piaget's theory became the foundation for the constructivist movement in education. Piaget did not believe that children learned directly from lessons taught by their teachers; he believed that children learned most effectively when provided with a stimulating environment that offered appropriate opportunities for problem solving (1974a, 1974b).

Piaget, however, was not a pure innatist; he did not believe that development was the sole product of internal biological forces or genetics (Ginsburg & Opper, 1988). He took children out of Rousseau's natural environs in the country and placed them in homes and classrooms that would offer them rich opportunities to teach themselves. According to Piaget, children would grow from infancy to adulthood by advancing through a series of qualitatively different stages—from

limited self-awareness and sensorimotor activity to the appreciation of subtle differences in opinion and abstract modes of thought.

Piaget stated (1936/1974b) that children would not develop according to a specific time table, and he cautioned that the rate of development could not be altered or accelerated by overenthusiastic parents and educators. Children would move through the stages at their own pace, adjusting and reorganizing their cognitive structures based upon the quality of their experience. Learning would occur through two primary channels: assimilation and accommodation. *Assimilation* refers to a process by which children incorporate new learning into their existing cognitive structures (i.e., their prior knowledge). *Accommodation* occurs when prior knowledge is insufficient or incorrect and existing neural structures have to be corrected or built from scratch. Assimilation was regarded as the easier, or preferred, vehicle of learning. Teachers of culturally and linguistically diverse classrooms well know how hard it is to learn through accommodation; much of what is taught in schools presumes a common experience or prior knowledge.

Lev Vygotsky

Although Vygotsky's research preceded much of Piaget's work, his theories on cognitive development were not available in English until the 1970s and 1980s, a time when Piaget's views were already enjoying great popularity in the classroom.

In the 1920s the Soviet Union was stricken by economic devastation, disease, and political strife. During this period, Vladimir Ilyich Lenin, leader of the revolution, charged artists, writers, and scientists with the responsibility of creating a new proletarian society; their artistic inclinations and their research, however, had to be singularly focused on creating the new Soviet citizen, and no one would be permitted to deviate from this purpose. Not only could there be no study of human weaknesses and foibles; Lenin banned research that did not celebrate the superiority of Soviet citizens. According to Lenin, there could be no ''impartial social science'' (or any other science, for that matter) in a society that aspired to build socialism (1913/1977). Those who were not able to accept the strictly utilitarian focus of the new regime and those who dared to focus on individualistic issues of personality would be condemned to exile or death with a single knock at the door.

Lev Semyonivich Vygotsky (1896–1934), a psychologist at the Moscow Institute of Psychology, was faced with a dilemma: how to pursue research in psychology during the post–civil war years in the Soviet Union. Given the harsh political realities, Vygotsky sought to develop a theory of cognition that would bridge the gap between those who believed that learning was a product of sensory experience, and those who avowed that mental activities were beyond the pale of human observation. He sought to establish a theory of mind that would move away from empiricist limitations and describe how sociohistorical influences molded the human capacity for language and thought. Vygotsky grounded his theory in the thinking of Karl Marx and Friedrich Engels, coauthors of the Communist Manifesto, and proposed that humans use ''psychological tools,'' or signs, in order to develop their intellectual skills (1930, 1978). According to Vygotsky, there were three primary sign systems: writing, numbering, and speech. He considered speech to be the most important.

Vygotsky believed that speech permitted children to internalize social forms of behavior, to use oral language (self-talk) as a vehicle for problem solving, and to enhance the development of linguistically based thought (1934/1986). He proposed that speech worked together with thought in a symbiotic fashion to foster higher-level cognitive skills. While Vygotsky did not disavow other forms of intelligence, his work was primarily in the area of linguistic intelligence. Language could be viewed within its sociohistorical context.

In contrast to Piaget, Vygotsky did not believe that children developed in distinct stages but rather through a gradual process of molecular change. According to Vygotsky, learning was based not only on a child's spontaneous efforts but also, and more importantly, on the influence of the sociohistoric environment. Children could be brought to higher levels of cognitive functioning by virtue

of assistance and guidance from their peers and caretakers. The *zone of proximal development*, a concept well known to western educators, was the difference between a child's level of actual development, as measured by his or her independent functioning, and what the child could achieve with support (i.e., *scaffolding*).

Initially, Vygotsky's views were met with interest in the Soviet Union; his theory, after all, was compatible with Soviet ideology and the utopian vision of the world, in which its citizenry would reflect the perfection of their system. However, two years after publication, Vygotsky's works were banned by the Central Committee of the Communist Party. Had he not died in 1934, likely he would not have survived the 1930s, during which time Stalin consolidated his power base through unprecedented political repression and persecution of individuals and populations who were suspected of dissention. Vygotsky's work was not published again officially until the thaw of 1956 under Nikita Khrushchev.

David Elkind: *The Hurried Child*

In 1981 David Elkind (1931–), professor of child development at Tufts University, published *The Hurried Child: Growing Up Too Fast Too Soon*, in which he cautioned that changes in the media, in home life, and in school were denying children the opportunity to be children. Elkind's book, now in its third edition, has sold over half a million copies (Cloud, 2007). Elkind built his reputation as the protector of childhood in a society that, in his opinion, treated children more and more like ''miniature adults.''

Elkind condemned the ''factory model'' of education that values test performance over individual differences. According to Elkind, expectations for literacy and numeracy in first grade have created a crisis of increasing numbers of children who are not developmentally ready for academic work. His article *Much Too Early* (2001) stated that formal instruction in reading and math should not be introduced until children are developmentally ready and they have reached the concrete operations stage as defined by Piaget (1936/1974b). Elkind, in fact, decried the Head Start program for spreading ''the pernicious belief that education is a race—and that the earlier you start, the earlier you finish'' (p. 9).

Elkind's views of childhood were adopted by many educators who easily moved from the concept of child-centered education to the notion that teaching skills to children prematurely could be stressful and have long-term consequences for children's well-being.

Legacy to Education

American educational practices reflect the heritage of some of the best thinkers of the past four hundred years; this legacy is shown in Table 2.1.

Whole Language Movement

John Dewey

The whole language movement of the 1970s has its roots in the work of the American philosopher, John Dewey (1859–1952), one of the leading educational theorists of the 20th century. Dewey (1897) believed that schools were social institutions that would prepare children to participate in society through meaningful experiences and opportunities for social interaction. He criticized schools for neglecting the importance of community life and social functioning and for focusing instead on science, literature, history, and geography.

Dewey (1898) believed that children should not be exposed to written language prior to the age of 8 and that reading was no longer the only key to culture as it had been in the past. Dewey implored teachers to consider young children's mental needs; he recommended that reading instruction be postponed until children developed their oral language skills, an early precursor to Piaget's concept of a developmentally approach to education. He believed that school primers, which taught children to read for reading's sake, starved children intellectually and forced them to develop

Table 2.1 **Legacy to Education**

Theorist	View of Learning	View of Language	Contribution to Current Educational Practices
John Locke (1632–1704)	Nurture	Language is divine.	*Tabula rasa*. Proponent of comprehensive, functionally oriented curriculum, including health, character education, and vocational instruction.
Jean-Jacques Rousseau (1712–1778)	Nature	Was language the product of love? Surprisingly, Rousseau was an early social interactionist.	Instruction should be ''child centered.'' Developmentally appropriate education.
John Dewey (1859–1952)	Nature/ Nurture	Language is essential for communication within a community.	Hands-on learning and experiential education.
Lev Vygotsky (1896–1934)	Nature/ Nurture	Language is both the medium and the message. It is a tool that facilitates cognitive development.	Zone of proximal development and scaffolding are both part of standard teaching practices today.
Jean Piaget (1896–1980)	Nature/ Nurture	Children's language is egocentric. It is a reflection of cognitive development.	Foundation for the constructivist movement in education. Children learn when provided with a stimulating environment offering appropriate opportunities for problem solving.
B. F. Skinner (1905–1990)	Nurture	Language is a behavior like any other that is learned through stimulus and response.	Concept of ''programmed instruction'' based on data.
Jerome Bruner (1915–)	Nature/ Nurture	Language is learned through motherese.	Importance of motivation, engagement, and rich educational opportunities for learning. Learning can be accelerated.
Noam Chomsky (1928–)	Nature	Language is biological.	Teachers should excite natural curiosity of young learners. Oral language is acquired naturally without need for direct instruction. Written language (syntax) must be taught if we want children to write according to rules for standard literary language.
David Elkind (1931–)	Nature		Condemnation of an educational system that introduces academic skills prematurely. Reading instruction should not be introduced until children have reached the concrete operations stage of development as defined by Piaget.

bad habits as thinkers. In *The Primary Education Fetich* (1898), Dewey stated, ''The pleas for the predominance of learning to read in early school life because of the great importance attached to literature seems to me a perversion'' (p. 323).

Edmund Burke Huey

In 1908 Edmund Burke Huey (1870–1913) of the United States published the *Psychology and Pedagogy of Reading*, the first definitive text on reading. Huey described reading as a wondrous silent visual process, and he wondered whether unnatural oral methods of reading instruction would lead to ''disastrous effects,'' including ''myopia, nerve exhaustion . . . [and] race degeneration'' (p. 8). Huey agreed with Dewey's recommendations that reading and writing skills should not be taught for their own sake and that teachers should promote a natural desire to read. Providing children with time to develop their own language skills would decrease ''the likelihood of producing mechanical habits of expression, and [would result in] less danger to speech-habits from the self-dissection of phonics'' (p. 311).

Huey felt that schools were ''over-bookish'' and that, in the future, books would not be used with children prior to their eighth or ninth year (According to Piaget's stages of cognitive development, children would likely be in the concrete operations stage [1974b]). ''Real reading'' would begin at the sentence level with a focus not on word recognition but on meaning. Huey did not feel that knowledge of letter names or sounds was necessary for reading. He advocated that children learn through drawing pictures, much in the same way that early civilizations used pictographs.

Developmental Approach

The whole language movement of the 1970s embraced the natural approach to reading, Piaget's theory of cognitive development, and the need for a developmental approach to education. Whole language teachers stepped away from the front of the classroom in order to design and support stimulating environments that would arouse children's natural curiosity and send them on a quest for knowledge. While there is no formal definition of the term *whole language*, it is generally acknowledged that whole language teachers work hard to motivate children to construct their own meaning by immersing them in rich language and literary traditions. According to Bette S. Bergeron, Professor of Education and Head of the Faculty at Arizona State University East, in her article *What Does the Term Whole Language Mean: Constructing a Definition from the Literature* (1990), whole language teachers emphasize the role of comprehension in reading, the writing process, cooperative groupings, as well as motivation and engagement.

Frank Smith

Whole language instruction, however, is also defined by what it is not, and for most whole language proponents, it does not include direct instruction in phonics. In 1971 Frank Smith published *Understanding Reading*, a book that became the rallying cry for the whole language movement. Riding on the coattails of the cognitive revolution, Smith attempted to secure a place for written language in the LAD that had been hypothesized by Chomsky. According to Smith, the same genetic programming that supported oral language development would also provide children with the skills needed for working with print. À la Chomsky, children would not be taught how to read by their teachers; they would become readers through meaningful opportunities to engage with text. The teacher's job was to respond to children's inquiries and to be supportive of their efforts in ways that would enhance self-esteem and risk taking.

Phonics instruction, Smith asserted, diverted children from the task at hand; it reduced reading to a rote exercise in word recognition, forcing children to process individual letters while compromising their attempts to construct meaning. He said that skilled reading could not be explained by sequential models in which readers attended to and analyzed individual letters and words. This process, he felt, would be confounded by

limitations of memory and by the irregularities of the English language. Instead, Smith believed that reading was a visual process that was directly linked to meaning.

In 1973 Smith released *Psycholinguistics and Reading*, a collection of articles in which he further condemned the practice of teaching phonics, the use of prepackaged instructional materials, and formal assessment. He decried many well-established practices in teaching, including but not limited to early mastery of the rules of reading, insistence on reading carefully and with accuracy, prompt feedback, special attention to children with poor reading skills, and the use of alternative methods when the current method was not effective.

According to Smith, teachers came to the profession with an innate understanding of how to impart academic skills. The word *eclectic* entered the profession of education as a descriptor for a teacher who was not a ''brainless purveyor of predigested instruction'' but rather one who used his or her intuition to guide instruction. Good teachers, Smith (1973) stated, did not rely on data to make their decisions. ''In terms of reading instruction, intuition is a sensitivity for the unspoken intellectual demands of a child, encouraging and responding to his hypothesis testing'' (p. 196).

More recently, in his book titled *Unspeakable Acts/Unnatural Practices: Flaws and Fallacies in ''Scientific'' Reading Instruction* (2003), Smith assailed the notion that children are not biologically equipped to learn to read, and he rejected the concept that teachers require training to teach reading. According to Smith, children have difficulty learning to read when reading is introduced prematurely or when they have been confused by misguided efforts of teachers. He stated:

> *References to mythical brain disabilities (diagnosed circularly in relation to perceived reading difficulty) explain nothing. Such phantasms are conjured up in the absence of understanding or coherent theory. And even if there were rare brain malfunctions that make it difficult for a few children and adults to read, that doesn't mean that such individuals should be subjected to regimes of unnatural treatment . . . . Calling them disabled is hardly likely to help. (p. 13)*

Three-Cueing System

Smith's views on reading inspired the development of the three-cueing system. (See Figure 2.1.) The progenitorship of this term is not clear, but according to Marilyn Jager Adams (1998), internationally known researcher in the fields of cognition and education, its first appearance may have occurred in 1976 in an article by David Pearson. Adams credits Kenneth S. Goodman, Professor Emeritus, Department of Language, Reading and Culture at the University of Arizona, for his work in the early 1970s with the proliferation of this approach within the whole language model.

The three-cueing system, widely taught in many teacher-education programs, is based on the premise that readers create meaning by integrating syntactic, semantic, and graphophonemic information in text. Although the diagram used to represent this process depicts three component skills, they are not given equal weight or importance, and they are not to be considered in isolation. The process by which meaning is constructed is not sequential but simultaneous; readers actively confirm and modify their understanding through a complex and multifaceted process, culminating in a product that is greater than the sum of its parts.

Teachers model the three-cueing system for beginning readers and for children with poor word-recognition skill. In order for comprehension to occur, readers actively use the cueing systems to verify their understanding. Children who use *semantic cues* rely on context and pictures to determine whether a given word makes sense.

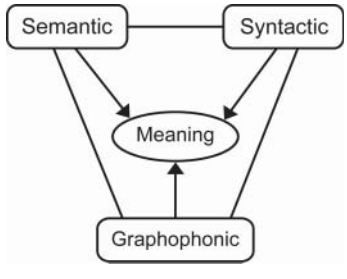

Figure 2.1
Three-Cueing System

They are encouraged to think about what has happened and predict what might logically be expected to happen next. *Syntactic cues* permit children to ascertain whether a word sounds right in a given context. Children are supported to rely on their grasp of sentence structure and produce a grammatically feasible guess for an unknown word. The *graphophonic system* is the system of last resort. According to Weaver (1988), undue focus on the graphophonic system detracts from the search for meaning. Smith argued in 1999 that ''[t]he first alternative and preference is—to skip over the puzzling word. The second alternative is to guess what the unknown words might be. And the final and least preferred alternative is to sound the word out. Phonics, in other words, comes last'' (p. 153). Goodman (1976) summed it up when he equated reading to a ''psycholinguistic guessing game'' (p. 126).

The reading research conducted over the last 40 years has not changed Smith's opinions. In language reminiscent of Dewey, Smith (2003) described recommendations in support of phonics in federally commissioned studies, such as the National Reading Panel, as a ''fetish . . . an object of irrational reverence and obsessive devotion'' (p. 45), and he did not accept studies of children with reading disabilities as evidence that children require direct instruction in reading.

Rebuttal

Many in the research community disagree with Smith. Kerry Hempenstall, professor at the Royal Melbourne Institute of Technology in Victoria, Australia, refers to the three-cueing system as a belief system that was based on a flawed understanding of the role of context in word recognition (2002, 2003). According to Adams in her article ''Why Not Phonics and Whole Language?'' (1991), the concept of an oral and written language acquisition device has not withstood the test of time. The more current understanding of reading is based on research from the fields of language and cognition. Adams expressed concern that teachers have come to interpret the three-cueing system as validation of the minimal role that word-recognition skills play in reading and that somehow, in a twist of convoluted logic, the understanding of the text has become the primary vehicle by which children come to decipher the words.

Adams and Hempenstall are not alone in their views. In July 1995 the Massachusetts commissioner of education, Dr. Robert Antonucci, received a letter signed by 40 experts in linguistics and reading who protested the ''scientifically unfounded views of language'' that downplayed the role of phonics and supported instead the use of contextual guessing (Eagle Forum, 1996).

The Code Perspective

Simple View of Reading

In the 1980s there were two competing views of reading instruction: those who believed that phonics-based instruction would divert children from the task of creating meaning (Goodman, 1976; Smith, 1973) and those who felt that decoding instruction was critical for children to access text content (Chall, 1967; Fries, 1963). The Simple View of Reading was developed to clarify some of the issues that were at the heart of the debate (Gough & Tunmer, 1986; Hoover & Gough, 1990).

According to the authors, reading comprehension (R) is the product of decoding (D) and linguistic comprehension (C). (Some researchers refer to C as language comprehension; others refer to it as listening comprehension.). In the spirit of Chomsky, who used mathematical models to represent the infinite variety of possible sentence structures, the relationship between these three variables was represented as $R = D \times C$ (D and C could range in value from 0 (poor skill) to 1 (perfect skill)). This equation captured the essence of what were, in the proponents' opinion, the three main types of reading disabilities; dyslexia, hyperlexia, and what is commonly referred to as the ''garden-variety reading disability.''

The Simple View, as shown in Figure 2.2, defines skilled reading as the product of decoding expertise and good linguistic comprehension. Weaknesses in either decoding or linguistic comprehension lead to poor reading comprehension.

Figure 2.2
Simple View of Reading

Dyslexia:

$$\text{If } R = D \times C, \text{ and } D = 0, \text{ then } R = 0.$$

Children with good receptive language ability (linguistic comprehension) and poor decoding skills will have poor reading comprehension.

Hyperlexia:

$$\text{If } R = D \times C, \text{ and } C = 0, \text{ then } R = 0.$$

Children with good decoding skills and poor receptive language ability will also have poor reading comprehension.

Garden-Variety Reading Disability:

$$\text{If } R = D \times C, \text{ and } D = 0 \text{ and } C = 0, \text{ then } R = 0.$$

Children with poor decoding skills and poor receptive language ability will also be poor comprehenders.

The Simple View of Reading has been widely cited in the literature. Hoover and Gough (1990) revisited this model in a longitudinal study of bilingual children in first through fourth grade. Researchers have attempted to fine-tune the model to explain the variance in reading comprehension (Chen & Vellutino, 1997). Joshi and Aaron (2000) proposed a more complex version of the Simple View in which naming speed of letters increased its predictive value. Nagy, Berninger, and Abbott (2006) found that morphological awareness also contributed to the variance in reading comprehension. Catts, Hogan, Adlof, and Barth (2003) examined the varying contributions of decoding ability and listening comprehension over time; they found that decoding skills accounted for a greater variance in the reading skills in young children and that listening comprehension played a larger role in the reading comprehension of eighth graders.

The increased role of listening comprehension over time reflects the importance of the world knowledge that we accumulate over time. Although we may think of listening comprehension as a purely linguistic entity, it is not possible to separate listening comprehension from issues related to vocabulary and background knowledge.

In 2006 Catts, Adlof, and Weismer reaffirmed the Simple View of Reading, noting its potential for helping teachers classify poor readers based on two parameters: word recognition and language. Although the model has been criticized for being overly simplistic, the Simple View of Reading reminds teachers and evaluators of the need to address both decoding ability and language skill. According to researchers, classification of young children based on language comprehension and word-recognition ability provides a platform for early intervention that targets the reading profiles of the majority of children.

Hollis S. Scarborough's Rope Model

Hollis Scarborough, senior scientist of Haskins Laboratories, a nonprofit institute in New Haven, CT, that conducts research on spoken and written language, has focused much of her research on longitudinal studies of children at risk for reading disabilities. Her ''rope model'' of reading

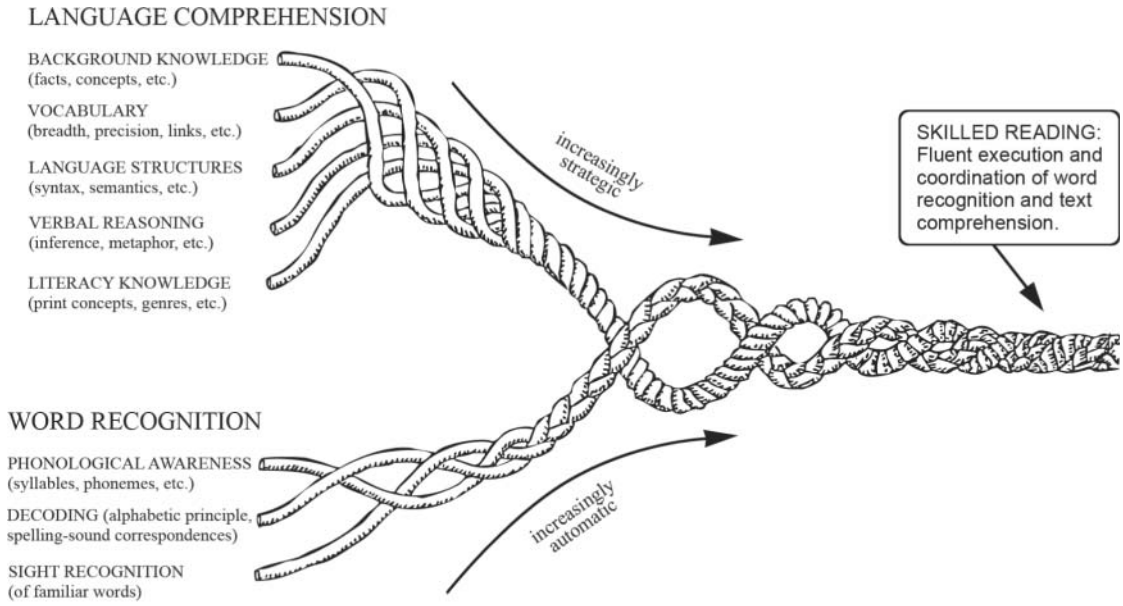

Figure 2.3

Strands of Early Literacy Development
Reprinted with permission from ''Connecting Early Language and Literacy to Later Reading Disabilities: Evidence, Theory, and Practice,'' by H. Scarborough, in S. Neuman and D. Dickinson (Eds.), 2001, *Handbook of Early Literacy Research*, pp. 97–110. New York, NY: Guilford Press, p. 98.

development (see Figure 2.3) depicts the strands of early literacy development that contribute to skilled reading (2001).

Scarborough's model focused on two domains: language comprehension and word recognition. Each domain consists of several subskills, or strands, that are fine-tuned, executed with increasing automaticity, and interwoven into reading comprehension skill. Scarborough acknowledged that most reading disabilities are consequences of poor phonemic awareness and poor decoding skills. She, however, noted that language comprehension deficits also play a significant role in the reading challenges of older children and that early language impairments are highly predictive of future reading impairment. Scarborough seeks to understand the factors that contribute to reading disabilities so that they can be addressed before children have difficulty in school.

McKenna and Stahl's Modified Cognitive Model

McKenna and Stahl's Modified Cognitive Model portrays reading comprehension as the integration of three strands: automatic word recognition, language comprehension, and strategic knowledge (2009). It is based on the model that the authors proposed in the first edition of their text, *Assessment for Reading Instruction* (2003). (See Figure 2.4.)

The strength of the McKenna and Stahl model lies in the addition of strategic knowledge as a third distinct contributor to reading comprehension. Strategic knowledge develops in young children with an initial understanding that reading can be entertaining or informative. Other students think strategically when they use their knowledge of genres and content to be selective in their reading and when they extend their comprehension

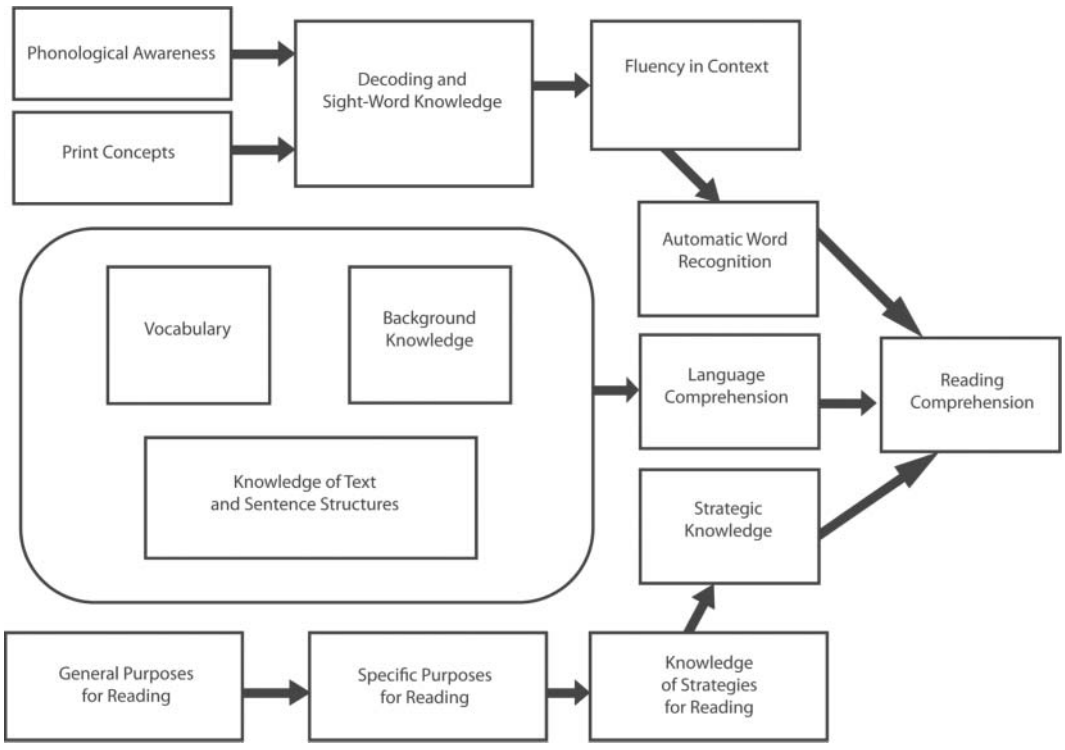

Figure 2.4

Modified Cognitive Model
Reprinted with permission from M. McKenna and K. Stahl (2009), *Assessment for reading instruction*. New York, NY: Guilford Press, p. 23.

through the judicious use of strategies. This area is not well captured by standardized testing and is better assessed through interviews and observation.

Models of Reading Acquisition

Knowledge of different models of reading acquisition permits evaluators to understand the development of reading in typical learners as a basis for discerning strengths and weaknesses in young readers.

Jeanne Chall and the Stages of Reading Development

In 1955 Rudolf Flesch published *Why Johnny Can't Read*, a book that shook the American public's confidence in teaching and in the textbook industry. The book proclaimed that the American educational system ignored research and minimized the role of phonics instruction, resulting in an alarming decline in literacy. The book provided instructions for parents who wanted to teach their own children at home; Flesch suggested that this process would take about 6 weeks. The book spent over 30 weeks on the best-seller list, and it was endorsed by *Reader's Digest*.

Educators and researchers were horrified at the popular appeal of the book, and they found themselves at a loss for a response. Jeanne Chall, professor at the Harvard Graduate School of Education, took on the task to investigate Flesch's claims. Her book *Learning to Read: The Great Debate* (1967) and her recommendations for

code-emphasis instruction for young children propelled her to the front lines of the reading wars. Critics believed that her focus on accurate decoding would be harmful to young children who needed to be encouraged to take risks. (See Chall, 1976.) Chall was reportedly subjected to intense professional and personal criticism; at the same time her text became required reading in many graduate-level teaching programs. Her work also became the foundation for the beginning reading skills taught on *Sesame Street* and *The Electric Company*, children's televisions series that were known for their efforts to educate young minds.

Chall's book *Stages of Reading Development* (1983) presented a developmental sequence beginning with oral language development and phonological awareness and culminating in the ability to synthesize a unique point of view based upon a variety of different materials read. Chall cloaked her stages under the umbrella of Piaget's developmental stages. She was not commenting on whether Piaget's stages were appropriate for reading but rather felt that his approach offered a context that would be helpful in learning about reading.

Chall's six stages (stage 0 through stage 5) (1983) were hierarchical in their structure; each stage was qualitatively different, requiring that children do ''different things' in relation to printed matter at each successive stage'' (p. 12). Chall proposed that children advanced through the stages by interacting with and adapting to their environment (accommodation and assimilation). Advancing to a higher reading stage would require the ability to handle increasingly complex language and cope with the demands for more technical, more abstract, and more specialized background knowledge. Children would move through the stages at different rates; insufficient mastery of skills at a particular stage would inhibit progress to a higher stage. Not all individuals would become stage 5 readers. (See Table 2.2.)

Stage 0: Prereading: From birth to age 6, children develop the ability to express their needs, wants, and feelings through oral language. By the time children enter the classroom, it is hoped that they have a sufficient vocabulary with which to language-label their experiences, as well as a basic command of sentence structure. During this period, children develop an interest in language play (i.e., the rhythm and the sound patterns of words). They can recognize and name letters of the alphabet, write their own names, and demonstrate knowledge of concepts related to reading, such as directionality, turning pages, and pretend reading.

Stage 1: Initial Reading, or Decoding: In first and second grade, children acquire knowledge of the sounds that letters make, and they abandon pseudo or pretend reading in order to become ''glued to the print'' and decode each word letter by letter (1983, p. 17). Chall noted that practice with lower-level decoding skills and a small sight vocabulary would lead to higher-level, more skilled performance that would, in time, support reading comprehension.

Stage 2: Confirmation, Fluency, Ungluing From Print: Children in second- and third-grade work on consolidating the skills acquired in stage 1 and on reading multisyllable words with greater accuracy and fluency. Stage 2 readers typically are provided with familiar text. In this way, they can self-confirm the accuracy of their decoding skills, and they can find comfort in their knowledge of how stories unfold.

Stage 3: Reading for Learning the New: A First Step: In grades 3 and 4, stage 3 readers are ready to use reading as a tool for learning. They learn best when provided with materials that are written from one point of view or perspective and that are not overly technical or demanding in terms of background knowledge. This is the time when students typically are introduced to their first content-area textbooks because they now have sufficient expertise in decoding to attend to new facts and concepts. Vocabulary becomes increasingly important. Most materials with Grade 4 readability introduce words that are not typically encountered in conversation or on television. Chall divided this stage into two phases, the first

Table 2.2 **Chall's Stages Reading**

	Instructional Emphasis	Skills Taught	Materials Used
Stage 0: Birth to age 6	Meaning	Experience with nursery rhymes, fairy tales, and stories popularized by the media. Instruction in oral language, letter names, and sounds, phonological awareness.	Picture books, alphabet books, opportunities to engage in pretend/pseudo-reading, writing, and language play
Stage 1: Grade 1	Decoding: Children's oral language abilities exceed their knowledge of written language.	Focus on decoding: Anglo-Saxon layer of English: basic phonics skills, the six-syllable patterns, and commonly used irregular words. Meaning: Further development of oral language skills (vocabulary, sentence structure, and narrative skills).	Children's storybooks, basal readers, and trade books
Stage 2: Grades 2–3	Decoding: Children's oral language skill continues to exceed their knowledge of written language. Familiar content permits children to confirm word recognition skill and find pleasure in recognizing what they know.	Focus on decoding and fluency: Introduction to Latin and Greek layers of English; affixes and roots. Application of structural analysis skills to multisyllable words. Meaning: Oral language skills (vocabulary, sentence structure, narrative skills, and story grammar). Development of background knowledge.	Children's storybooks, workbooks, basal readers and trade books, familiar fiction and nonfiction
Stage 3: Grades 4–8	Meaning: Children now read with sufficient automaticity and fluency to focus on learning new content. The language of text is more sophisticated than oral language in the home or in the classroom. Children will continue to benefit from work with advanced structural analysis skills and morphemes to build vocabulary and increase reading speed.	Focus on reading for meaning: Story grammar, introduction to expository text and structures, and strategies to extend comprehension. Development of background knowledge.	Children's literature, basal readers, workbooks, content-area textbooks, beginning reference materials, and Internet sources

Table 2.2 (*continued*)

	Instructional Emphasis	Skills Taught	Materials Used
Stage 4: Grades 9–12	Meaning: Students actively use strategies for reading texts written from different perspectives.	Focus on reading for meaning in depth: Increased expertise with higher-level language, inferential thinking, genres, narrative and expository text structures, perspective, background knowledge, specialized vocabulary, and technical concepts.	Fiction and nonfiction, reference materials, newspapers, magazines, and Internet sources
Stage 5: College	Meaning: Students create their own world view based on materials that they have read and analyzed.	Focus on verbal reasoning and inferential thinking skills: Analysis of genres, text structures, style, and author's perspective as a foundation for drawing individual conclusions.	Fiction and nonfiction, periodicals, journals, and Internet sources

Source: Adapted from J. Chall (1983), *Stages of Reading Development,* New York, NY: McGraw-Hill.

for grades 4–6 and the second for grades 7–8, which are marked by an increase in analytical and critical thinking ability.

Stage 4: Multiple Viewpoints: Students at the high school level are required to compare and contrast texts that present a variety of points of view. This skill level is acquired through formal education and exposure to textbooks and reference works in the sciences.

Stage 5: Construction and Reconstruction—A Worldview: According to Chall, stage 5 reading is ''constructive.'' Stage 5 readers read with purpose and with selectivity; they make conscious decisions regarding how much to read and with what level of detail. Stage 5 readers not only take in new learning, they understand the content on a higher level of abstraction, and they actively formulate their own opinions, draw unique conclusions, and create new points of view.

Chall believed that her reading stage theory had potential for optimizing instruction for children of different ages and for the development of diagnostic-prescriptive tests. In particular, she felt that a stage scheme would provide a clearer picture of children with reading difficulty and of how to match instruction to individual need.

Chall's stages of reading are summarized in Table 2.2.

Chall's last book (2000), *The Academic Achievement Challenge: What Really Works in the Classroom,* was published posthumously. To the end Chall was concerned with how to raise student achievement for all children, particularly those of low socioeconomic status. Her first recommendation was that teachers used a more teacher-centered approach in the classroom; teacher-centered approaches are explicit in their presentation of new learning, how it is to be learned, and what is to be mastered. Chall's second recommendation regarded the importance of closing the gap between the research community and teachers in their classrooms.

Linnea Ehri: Spelling Development and Reading Acquisition

Linnea Ehri, professor at the Graduate Center of the City University of New York, proposed a

different model by which children become readers (1995, 1999). She suggested that children's skill in word recognition develops in four phases that culminate in the ability to read words instantaneously without conscious effort, what is called reading by sight.

Ehri noted that the concept of sight word reading is often confused with sight word instruction. According to Ehri, *sight word reading* refers to words that readers have read several times and that have been successfully stored in memory with links to spelling, pronunciation, and meaning. These words may be regular or irregular, and they may have been acquired through the application of word attack strategies, reading by analogy, or possibly through prediction. Gough and Walsh (1991) demonstrated that most content words cannot be guessed with any degree of accuracy. Sight word reading is not related to the practice of using flashcards or solely visual methods for teaching reading.

Ehri's phases of sight word development represent the skills that all readers must acquire in order to build a sight word vocabulary. Although similar to Chall's stages, Ehri (2004) opted to speak of phases. Phases, she felt, were not qualitatively different from one another; children gradually moved from one phase to the next. Each phase, however, ''highlights the type of alphabetic knowledge that predominates in reading words'' (p. 439).

Prealphabetic Phase: This phase is a partial representation of Chall's Stage 0. It generally refers to children in preschool and kindergarten who have not yet had formal instruction. These children do not yet have an understanding of sound–symbol correspondence, and they attempt to recognize words through paired associations and visual features. According to Ehri, prealphabetic students engage in ''visual cue reading,'' in which they focus more on nonalphabetic cues, such as the environment, than on the letters themselves. In this phase, McDonald's golden arches are more important than the letter *m*. Students in this phase are not yet able to read connected text independently.

Partial-Alphabetic Phase: In this phase children learn some of the alphabet and attempt to recognize words by using both context and partial-letter cues. For example, a child looking at a picture of a house might guess ''house'' when seeing a word beginning with the letter *h*. Students at this phase may not have developed a strong sense of left-right directionality. When writing, partial-alphabetic children will represent the sounds in words that they perceive (typically sounds in the word-initial and word-final positions). They will find it easier to learn letter sounds when the sounds are reflected in the letter name.

Full-Alphabetic Phase: The full-alphabetic phase is equivalent to Chall's Stage 1. When children reach this phase, they are able to use their knowledge of sounds and letters to decode unfamiliar words. This phase is initially marked by slow and deliberate efforts to sound out words. As they receive more practice, however, children are able to read a corpus of words by sight as well as by analogy. According to Ehri, this phase requires systematic instruction in phonemic awareness and phonics. Progress through this phase is enhanced when students are provided with text that is well matched to their decoding skills and that does not cause undue frustration. Text reading practice is important to ensure that students have sufficient exposure to new words in order to retain them in memory. According to Reitsma's study in 1983, most readers are able to retain new sight words in memory with four practice trials (Ehri, 1995).

Consolidated-Alphabetic Phase: This phase, which is also referred to as the orthographic phrase, reflects a period in which students consolidate their knowledge of letter sequences into units, such as ''affixes, word roots, onsets, rimes, and syllables'' (Ehri, 1995, p. 433). It is consistent with Chall's Stage 2. Chunking of letter sequences permits students to read with greater accuracy and fluency and add multisyllable words to their repertoire of sight words. According to Ehri, multisyllable words are stored as sight words once

readers have analyzed their graphosyllabic units (sup-port-ing).

Ehri and Snowling (2004) offered her phases as an aid to educators who are seeking to determine appropriate instruction for typical and atypical readers. She noted that, while atypical readers might appear to require the same instructional activities as their typical peers, they do not present with the same strengths and weaknesses. Children with poor reading skills will need ''concrete instruction and multisensory learning to circumvent weaknesses, without extensive reliance on auditory processing'' (p. 454). Ehri cautioned educators to avoid approaches that focus on training phonemic awareness in isolation, stating that ''the research consensus is that, for poor readers, training phonemes in isolation is much less effective than phoneme training linked to letters in print.''

In fact, Ehri's research (1989) suggested that many children with dyslexia have phonological deficits because they have not learned to read and spell. In contrast to other researchers who believe that phonological deficits are a significant cause of reading disabilities (Stanovich, 1986), Ehri believed that phonological deficits are experiential in nature and that phonemic awareness does not develop fully until students have learned to map letter symbols to sounds in words. This process causes students to fine-tune their knowledge of sounds, which in turn supports the development of more advanced phonics and spelling skills. According to Ehri, as illustrated in Figure 2.5, phonemic awareness promotes spelling, and spelling promotes higher degrees of phonemic awareness.

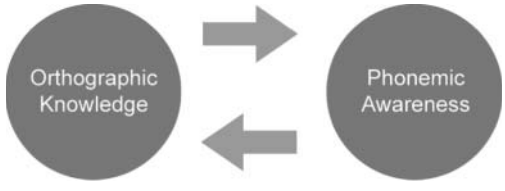

Figure 2.5

Orthographic and Phonemic Awareness

Spear-Swerling and Sternberg: Readers Off Track

Spear-Swerling and Sternberg wrote *Off Track: When Poor Readers Become ''Learning Disabled''* (1996), which presented a model of reading development specifically to help teachers analyze reading difficulties. The authors expressed concern regarding the large number of children who were identified as having reading disabilities. They advocated a view of reading difficulty based not on a discrepancy between intelligence and achievement but on a model in which children with reading disabilities ''[stray] from the path of typical reading development'' (p. xiii). Their hope was that educators would use this model, a small portion of which is illustrated in Figure 2.6, to think more proactively and more knowledgeably to address children's needs before their difficulties require placement in a special education program.

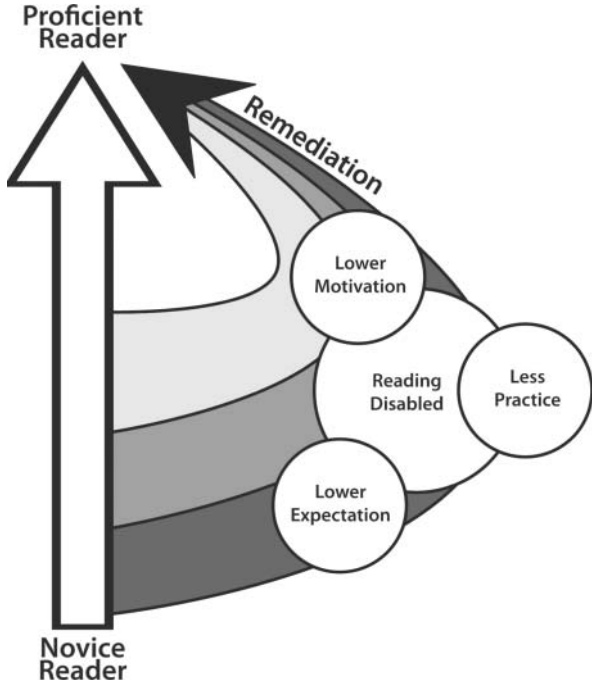

Figure 2.6

Adaptation of Spear-Swerling and Sternberg Model

Spear-Swerling and Sternberg (1996) acknowledged that a variety of intrinsic and extrinsic factors contribute to reading difficulty. Children with traumatic experiences and/or emotional and behavioral challenges have difficulty learning. Children from linguistically and culturally diverse backgrounds, as well as those with lower socioeconomic status, may also struggle with print. All these factors present real challenges in the classroom, and each contributes in its own way to learning difficulty. An overreliance on external factors without consideration of children's profiles as learners will not be sufficient for children to become readers.

Spear-Swerling and Sternberg's (1996) road map presented the path that typical students follow in their acquisition of reading skill. The authors based their model on Ehri's phases of word recognition, culminating in highly proficient reading (equivalent to Chall's Stages 4 and 5). The Spear-Swerling and Sternberg model focused more on word recognition than on challenges related to comprehension, most likely due to the fact that most children with reading difficulty struggle with word recognition and not with challenges related to receptive language skill.

In contrast to other models, the Spear-Swerling and Sternberg (1996) model attempted to convey the importance of prompt appropriate intervention and the costs associated with profound reading difficulty. Children who fail to make progress in reading do not simply remain comfortably at a particular stage or phase; over time they experience increasing challenges with motivation, insufficient practice, and lowered expectations. Spear-Swerling and Sternberg did not rule out different subtypes of reading disabilities, and they certainly did not recognize a single distinct cause of reading failure. They considered each child within the context of who they were as learners and their instructional environment.

Conclusion

Models provide a framework for understanding how reading skills typically develop and for understanding the different components that contribute to reading comprehension. There is no perfect model that captures the intricacies of a child's reading skill at a given moment, and certainly no model integrates individual strengths, weaknesses, and subtleties of character and what they mean for risk taking in learning.

When we assess children, it is our responsibility to craft evaluations that are founded in best practices and that consider the whole child in terms of his or her community, family, and instructional experience as well as specific strengths and challenges. As students of assessment, reading, language, and cognition, we should not feel the need to embrace one philosophy of education to the complete exclusion of another. We need, however, to make our decisions based on careful reading of research, our knowledge of children as learners, and our knowledge of the tools of assessment.

Review Questions

1. The whole language movement has its roots in Noam Chomsky's belief that humans were uniquely predisposed to acquire language. Explain the connection.
2. You are at a team meeting, and one of the team members analyzes the student's errors in terms of the three-cueing system. Describe the cueing system and how phonics fits into this approach to reading.
3. The Simple View of Reading (Gough & Tunmer, 1986; Hoover & Gough, 1990) was developed in order to provide a framework for understanding reading comprehension. What is the Simple View, and how would it help you to make decisions about what to test in a comprehensive reading evaluation?
4. Compare the Simple View of Reading (Gough & Tunmer, 1986; Hoover & Gough, 1990) with Scarborough's rope model (2001).
5. Outline Chall's stages of reading development (1983). Why is it important to teach to the stage of reading development and not to the grade?
6. According to Ehri, what is more effective: training phonemic awareness in isolation or training phonemic awareness in conjunction with phonics?

Oral Language

3
Chapter

Introduction

The clash between the titans and the gods of Olympus was no less intense than the battle that consumed linguists across the United States during the 1960s. According to Bruner (1983), ''George Miller said it well. We now had two theories of language acquisition; one of them, empiricist associationism, was impossible; the other nativism, was miraculous'' (p. 34).

The empiricists saw language as a behavior like any other, a function of stimulus and response. According to the empiricists, knowledge was acquired through experience. In contrast, Chomsky presented a view of language that celebrated the human capacity for rule generation and the infinite possibilities that language could bring to thought. Was it possible that Chomsky was correct? Do humans acquire language by virtue of their genetics? What is the role of parents and teachers, and how do they promote language development in children?

This chapter examines the oral language foundation that supports the development of reading and writing skill. It briefly reviews the structure of oral language, current theories and research related to language acquisition, and the stages of speech and language development.

The Language of Language

Language is the communication of thoughts and feelings by means of a formalized system of abstract symbols and rule-governed structures (Farrall, 1994). These symbols may take on the form of gestures, signs, speech sounds, or letters of the alphabet. Because language is a reflection of our biology, all languages have much in common. Languages provide us with an inexhaustible means of expression. Not only can we discuss the here and now, we can speak of events in the past and those yet to come. Languages also provide speakers with the tools for the creation of new words; they provide us with the means to interpret word combinations never before heard or experienced.

We cannot discuss the miracle of human communication without devoting a large part of the discussion to speech itself. *Speech* is defined as oral language; in many languages, the word for *speech* is the same word as for *tongue*. In English, we talk of speaking in tongues. This association is highly appropriate, given the tongue's important role in making speech sounds.

Although speech is often touted as what separates us from the animal kingdom, many learned authorities state that speech is not always a reflection of people at their best. The fact that we may

find ourselves speaking without thought may be the best argument there is for the separate provenance of language and cognition. W. Somerset Maugham (1874–1965), the novelist and short story writer, cautioned, ''If nobody spoke unless he had something to say, the human race would very soon lose the use of speech'' (p. 38).

Linguistics is the study of language. Within the field of linguistics, there are different specialties. Historical linguists analyze how languages change over time, a field that was inspired by the work of the Brothers Grimm. The field of comparative linguistics seeks to organize languages into branches or families in an effort to reconstruct the mother tongue. Chomsky's work from the 1950s inspired the search for what languages have in common and what those commonalities tell us about what it means to be human.

Psycholinguists explore the relationship between cognition and language, with a growing focus on the neurobiology of language. The first conference on the neurobiology of language was held in Chicago in 2009. Structural linguists seek to discern the rules governing the different components of language. It was Terry Allen Winograd (1983) who compared the study of structural linguistics to the field of chemistry. Electrons and protons are combined into atoms; atoms are combined into molecules. In the field of structural linguistics, individual speech sounds are combined into words, words are combined into phrases, and phrases are combined into sentences. Sentences become the building blocks for oral and written discourse.

The structure of language is divided into five components or layers: phonology, morphology, syntax, semantics, and pragmatics. As shown in Figure 3.1, we might think about language in the form of a pyramid, culminating with the effective use of language at its pinnacle.

We begin with an overview of the building blocks of the pyramid and work our way up layer by layer. The layers are not necessarily distinct from one another; there are areas in which they overlap. Each area, however, will aid you in your efforts to analyze how children decode, how they comprehend, and how they write.

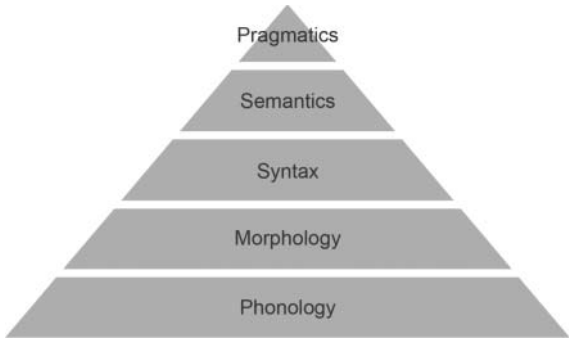

Figure 3.1

Language Pyramid

- *Phonology* is the study of the sound system of a language and the rules by which sounds are combined. The study of phonology is divided into two main disciplines: phonetics and phonemics. Specialists in *phonetics* focus on actual physical speech sounds, called phones, in the context of their production, transmission, and reception. Specialists in *phonemics* study sounds in the abstraction (phonemes) and how we conceptualize the sounds of a given language. Knowledge of phonetics and phonemics permits us to analyze children's decoding and spelling errors so that we can make explicit recommendations for instruction and remediation. We discuss more about phonology in Chapter 10.
- *Morphology* is the study of word structure, more specifically prefixes, roots, and suffixes. A grasp of morphology helps us analyze spelling, grammar, and vocabulary usage. We examine morphology in greater detail in Chapter 9.
- *Syntax* focuses on how words are combined into grammatical units. An understanding of sentence structure permits us to identify challenges in written expression as well as difficulties that students encounter in reading passages. We discuss the development of syntax in this chapter as well as in Chapter 14.
- *Semantics* involves the study of how words are combined to create meaning. Expertise in semantics help us to understand the barriers that some children encounter when they attempt to read text with abstract and figurative

expressions, words with multiple meanings, and subtle differences in phrasing and word order. Issues related to semantics are addressed in Chapter 9 as part of the discussion of oral language assessment.

- *Pragmatics* is the art of using language effectively to achieve needs, wants, and desires. An understanding of pragmatics is important for grasping the implications of language style and the indirect ways people have of conveying their intent. More on pragmatics is found in the section on language acquisition in this chapter and in Chapter 9.

Knowledge of each layer of the language pyramid from phonology to pragmatics permits us to craft evaluations with meaningful, focused recommendations. Now that we have a basic understanding of the different skills involved in oral language processing, we look at how language is acquired.

Language Acquisition

George Stewart, in his book *Man, An Autobiography* (1946), mused about the origin of language. He suggested that early woman's urgent need to bring help to her companion in distress may have been the genesis for the first multiword utterance. Stewart wrote, ''In desperation, naturally enough and yet with a stroke of genius, she cried, 'Coo-ouch!' Then they knew that he who was called Coo had been taken with a sudden pain'' (pp. 32–33). Stewart went on to say:

> *I like to think that the mothers may first have made and practiced language, and that for some generations the fathers still sat around merely grunting while the others chattered happily. At least I notice that girl-babies are still quicker than boy-babies, and that they grow up in general to be more fluent talkers. Besides, there has always been in language a great deal of an illogical and emotional quality. I might say, ''Women invented language, but men invented grammar.'' (p. 33)*

Whether gender actually played a role in the development of language will always be the source of playful speculation in the battle between the sexes. The more serious question of how young children acquire language continues to pique the curiosity of linguists, researchers, teachers, and parents.

LAD and LASS

N. Chomsky's *Review of B. F. Skinner's Verbal Behavior*, published in 1959, was the linguistic equivalent of the face that launched a thousand ships. Chomsky's Language Acquisition Device (LAD) was a direct assault on Skinner's black box. It moved the discussion of language from the observable world to the internal workings of the mind, where it gave language a unique status apart from that of general cognition. Language was not a behavior like any other, and it was not taught. Humans acquired language by virtue of their genetics. The acquisition of language was a process akin to physical maturation.

Not everyone, however, agreed with Chomsky. Jerome Bruner (1983), an American cognitive psychologist, found Chomsky's LAD to be lacking. According to Bruner, language could not possibly develop in a vacuum without the support of environmental influences. As an alternative, Bruner proposed the Language Acquisition Support System (LASS). Although the LASS acknowledged the genetic contribution to language, it stressed the role of the community and family in language development. In this model, the adult community (i.e., the LASS) modifies language to meet children's needs and in doing so helps children move from babbling to linguistic expression. Bruner's views were not unlike those of Lev Vygotsky, who stressed the importance of the zone of proximal development. According to Vygotsky (1930/1978), adults support skill development in children through modeling and interaction.

Social Interactionism

The union of the LAD and the LASS would come to be known as social interactionism, which is often touted as the compromise that permits nature and nurture enthusiasts to coexist under the