HOW SHOULD READING BE TAUGHT?

Educators have long argued over the best way to teach reading to children. The research, however, indicates that a highly popular method is inadequate on its own.

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Most of us are a little fuzzy on how we learned to read, much as we cannot recall anything special about learning to talk. Although these skills are related, the ways we acquire them differ profoundly. Learning to speak is automatic for almost all children brought up in normal circumstances, but learning to read requires elaborate instruction and conscious effort. Remember how hard it once was? Reading this page with the magazine turned upside down should bring back some of the struggles of early childhood, when working through even a simple passage was a slog.

Well aware of the difficulties, educators have given a great deal of thought to how they can best help children learn to read. No single method has triumphed. Indeed, heated arguments about the most appropriate form of reading instruction continue to polarize the teaching community. To help forge a consensus, we recently came together under the aegis of the American Psychological Society to review the voluminous research on the mental processing that underlies skilled reading and on how reading should be taught. The results point strongly in directions that may disturb some parents.

Three general approaches have been tried. In one, called whole-word instruction (also known as the "look-say" method), children learn by rote how to recognize at a glance a vocabulary of 50 to 100 words. Then they gradually acquire other words, often through seeing them used over and over in the context of a story. ("Run, Spot, run," from the well-known Dick and Jane series of readers, is a classic example of a sentence designed to aid whole--word instruction.) This procedure could just as well be used to learn Chinese, in which each character in the written language corresponds to a word or word root.

Actually, for the past half a century, youngsters in China have followed a different prescription: as a first step toward literacy, they are taught to read Chinese words using the Roman alphabet. Similarly, speakers of most other languages learn the relationship between letters and the sounds associated with them (phonemes). That is, children are taught how to use their knowledge of the alphabet to sound out words. This procedure constitutes a second approach to teaching reading—the phonics so familiar to baby boomers.

The connections between letters and phonemes would appear simple enough. For example, the letter "b" almost always sounds the same as it does in the word "bat." Or consider the silent "e," which denotes that the preceding vowel has a long sound, as in the words "pave," "save" and "gave." Although

the final “e” is not voiced, its role is straightforward. English, however, offers plenty of exceptions—take the word “have.” There are, in fact, hundreds of deviations from the normal patterns, including “give,” “said,” “is,” “was,” “were,” “done” and “some.” Such problematic yet common words are among the first a child has to learn.

Clearly, the lack of perfect correspondence between letters and sounds is a source of confusion and a potential roadblock for the beginning reader. As a result, many schools have adopted a different approach: the whole-language method (also called literature-based instruction or guided reading). The strategy here is similar to whole-word instruction, but it relies more heavily on the child’s experience with language. For example, students are offered engaging books and are encouraged to guess the words that they do not know by considering the context of the sentence or by looking for clues in the story line and illustrations, rather than trying to sound them out. Often children are given the opportunity to write stories of their own, in an effort to instill a love of words and reading.

The whole-language approach aims to make reading instruction enjoyable. One of its key principles is that the rules of phonics should *not* be taught directly. Rather the connection between letters and sounds should be learned incidentally through exposure to text. This methodology stipulates that students should not be corrected when they make errors reading words. The philosophical rationale is that learning to read, like learning to speak, is a natural act that children can essentially teach themselves how to do. Just how well that assumption holds up in practice often depends on the individual.

Overview/Teaching *Reading*

- Learning to read is a crucial step in children’s education because those who fare poorly in the early grades are unlikely to catch up with their more skilled classmates, even after years of further schooling.
- During the 1990s many educators in America abandoned the traditional “phonics” method of reading instruction: teaching children directly the correspondences between spoken sounds and letters that represent them. Instead, elementary school teachers turned to various “whole-language” methods, by which students learn the connections between letters and sounds incidentally in the course of literature-based activities.
- Evaluations of the effectiveness of the two methods have shown that children become skilled readers much more readily when their instruction includes phonics. Modern research in psychology and linguistics helps to explain why this is so.

How Beginners Learn to Read

ALTHOUGH MANY PARENTS might think that innate intelligence will govern how well their kids learn to read no matter what type of instruction is given, the evidence suggests otherwise. Two separate studies from the 1960s and 1970s have shown that, in general, IQ has very little bearing on early reading ability. More recently, researchers have found that children who have difficulty learning to read often have above--average IQs.

It might also be tempting to believe that the differences in early reading ability wash out over time, but that, too, is a misconception. Keith E. Stanovich of the University of Toronto has, for example, shown that children’s facility with reading in the first grade usually provides a good indication of what their

11th--grade reading proficiency will turn out to be. Why? Because reading requires practice, and those who excel end up practicing the most. Hence, the gap between more and less able readers in the first few grades generally grows over the years.

Teaching children to read well early on obviously helps to develop a valuable lifetime habit; thus, it is no wonder that educators have placed enormous emphasis on finding the best way to teach these skills. At one time, a great deal of debate in educational circles centered on whether whole-word or phonics instruction was the most effective. But over the past decade or so, arguments have revolved around the relative merits of phonics and whole-word's successor, whole-language.

Many teachers adopted the whole-language approach because of its intuitive appeal. After all, making reading fun promises to keep children motivated, and learning to read depends more on what the student does than on what the teacher does. But the prospect of keeping kids interested would not have been enough by itself to convince teachers to use the whole-language method. What really sold it was an educational philosophy that empowered teachers to compose their own curricula and encouraged them to treat children as active participants, an enticing combination that was promoted with flair by some educator celebrities. The presumed benefits of whole--language instruction—and the stark contrast to the perceived dullness of phonics—led to its growing acceptance across America during the 1990s.

In Massachusetts, for example, whole-language almost became the official state method of instruction with passage of the Massachusetts Education Reform Act of 1993. That legislation changed what had been a tradition of little state involvement in school curriculum. The law promised to increase state funding for public education, and in exchange local school systems were required to meet new state standards.

Despite the previous lack of central control, the reading curricula in Massachusetts public schools were rather uniform— and it is not difficult to understand why. As in other places, teachers and administrators took the same courses at the same handful of universities, attended the same workshops, bought the same textbooks and responded to the same educational fashions. Hence, the committee of educators charged by the state government with framing a statement about how reading should be taught were heavily influenced by the whole-language approach. And naturally enough, the document they produced highlighted the idea that children could learn to read the same way they learned to talk. It presented a vision of language acquisition that attributed the process to curiosity and enthusiasm alone, and it seemed authoritative, claiming support from research.

As it happens, Massachusetts is home to hubs of research in linguistics and the psychology of reading —at the Massachusetts Institute of Technology and the University of Massachusetts at Amherst. After the content of the proposed curriculum document became known, a number of scholars in these places (including two of us) reacted strongly. Dozens of linguists and psychologists signed a letter taking issue with the document's assertion that research supported whole--language instruction. They sent it to the state commissioner of education, who eventually saw to it that corrections were made and that state standards reflected the actual research results.

By chance, this incident took place just as debate about how to teach reading was heating up in other states (most notably, in California and Texas). Sides were often divided along political lines, with conservatives backing phonics and liberals favoring whole--language instruction. Consequently, the Massachusetts dispute drew national attention. In particular, conservative newsletters and Web sites

created considerable publicity for the researchers' letter—an ironic twist, given that the list of professors who signed it included several well--known leftists.

Why Phonics?

WHY DID SO MANY LINGUISTS and psychologists object strongly to the abandonment of phonics? In short, because research had clearly demonstrated that understanding how letters relate to the component sounds of words is critically important in reading. Our recent review of the topic shows that there is no doubt about it: teaching that makes the rules of phonics clear will ultimately be more successful than teaching that does not. Admittedly, some children can infer these principles on their own, but most need explicit instruction in phonics, or their reading skills will suffer.

This conclusion rests, in part, on knowledge of how experienced readers make sense of words on a page—an understanding that psychologists have developed over many decades. One of the first researchers to investigate the nature of reading was James M. Cattell, an American psychologist of the Victorian era. To test whether proficient readers were taking in words letter by letter or all at once, he performed a pioneering experiment, exposing subjects very briefly to whole words or to individual letters and asking them what they saw. He found that they were better able to report words than letters. Thus, it seemed apparent to him that people do not absorb printed words one letter at a time. (Such findings helped to motivate the creation of the whole-word method later on.) More recent research has refined our knowledge of this phenomenon. For example, studies that track eye movements during reading show that although people register each letter in a word as a separate symbol, they normally perceive all the letters in a word simultaneously.

The question of whether accomplished readers mentally sound out words took longer to answer. Advocates of whole-language instruction have argued forcefully for more than 20 years that people often derive meanings directly from print without ever determining the sound of the word. Some psychologists today accept this view, but most believe that reading is typically a process of rapidly sounding out words mentally, even for the highly skilled.

The most compelling evidence for this last contention comes from clever experiments by Guy Van Orden of Arizona State University wherein a subject is first asked a question, such as "Is it a flower?" He or she is then presented with a target word (for example, "rose") and asked whether the word fits the category. Sometimes the subject is offered a word that sounds the same as a correct answer (called a homophone—say, "rows" instead of "rose"). Subjects often mistakenly identify such words as fitting the category, and these incorrect responses show that readers routinely convert strings of letters to sounds (or rather, to their unvoiced mental equivalents), which they then use to ascertain meanings.

Some eye-movement studies have used homophones to demonstrate that the process of sounding out words mentally begins very rapidly after a reader's gaze first fixes on a particular word. And recent brain studies show that the primary motor cortex is active during reading, presumably because it is involved with mouth movements used in reading aloud.

Consequently, psychologists now know that the process of mentally sounding out words is an integral part of silent reading, even for the highly skilled. This understanding suggests that learning the correspondences between letters and sounds—that is to say, phonics—is keenly important for beginners. Further support for phonics instruction comes from experiments designed to mimic the way people learn to read.

Investigators have, for example, trained English-speaking college students to read using unfamiliar symbols such as Arabic letters. One group learned the phonemes associated with individual Arabic letters (the phonics approach), while another group learned entire words associated with certain strings of Arabic letters (whole--word). Then both groups were required to read a new set of words constructed from the original characters. In general, readers who were taught the rules of phonics could read many more new words than those trained with a whole-word procedure. Research using computer programs that simulate how children read also indicates that gaining a command of phonics is easier than learning to associate whole words with their meanings.

Classroom studies comparing phonics with either whole-word or whole-language instruction are also quite illuminating. The late Jeanne S. Chall of Harvard University carried out a comprehensive review of such work, as subsequently did Marilyn J. Adams, who was also affiliated with Harvard. In a nutshell, their reviews, as well as our own, show that systematic phonics instruction produces higher achievement for beginning readers. The differences are greatest for students at risk of failing to learn to read, such as those living in homes where the value of literacy is not emphasized.

One particularly persuasive study was undertaken as long ago as 1985. Mary Ann Evans of the University of Guelph in Canada and Thomas H. Carr of Michigan State University compared two programs used in 20 first-grade classrooms. Half the students were offered traditional reading instruction, which included the use of specially designed readers, phonics drills and applications. The other half were taught using an individualized method that drew from their experiences with language; these children produced their own booklets of stories and developed sets of words to be recognized (common components of the whole-language approach). The two groups spent the same amount of time on reading, had similar socioeconomic profiles and were virtually identical on measures of intelligence and language maturity. Yet this study found that the first group scored higher at year's end on tests of reading and comprehension.

More recent investigations (namely, authoritative evaluations by the National Reading Panel and the National Research Council) examining all the available studies echo these results. Influenced by such findings, the Bush administration is now promoting the inclusion of phonics in reading programs nationwide.

How Phonics is Taught.

IN TEACHING PHONICS, instructors present the spellings for different sounds in a specific order, introducing the simplest (or most useful) patterns early on. They then practice these patterns with their students using engaging stories.

Some teachers prefer to dispense with such structured programs and to create phonics lessons on their own. Doing so is no small chore, because they have so many decisions to make. Should rules be taught for all the ways to spell each of the approximately 40 distinct sounds (phonemes) of American English? For the long "a" alone, there are eight spelling patterns, as in "make," "rain," "say," "they," "baby," "eight," "vein" and "great." And do all the phonemes need attention? For example, do the vowel sounds in "book" and "moon" both need to be taught?

Although some teachers can tackle these questions and create phonics lessons that are every bit as effective as those provided in a published program, most probably have too many demands on their

time to take on that task. Just how much latitude phonics instructors should be given and how effectively they can make use of the flexibility remain points of debate in a number of school districts.

A Delicate Balance

IF RESEARCHERS ARE SO CONVINCED about the need for phonics instruction, why does the debate continue? --Because the controversy is enmeshed in the philosophical differences between traditional and progressive approaches, differences that have divided American educators for years. The progressives challenge the results of laboratory tests and classroom studies on the basis of a broad philosophical skepticism about the value of such research. They champion student-centered learning and teacher empowerment. Sadly, they fail to realize that these very admirable educational values are equally consistent with the teaching of phonics.

If schools of education insisted that would-be reading teachers learned something about the vast research in linguistics and psychology that bears on reading, and if these institutions regularly included a modern, high-quality course on phonics, their graduates would be more eager to use phonics and would be prepared to do so effectively. They would not have to follow scripted programs or rely on formulaic workbooks and could allow their pupils to apply the principles of phonics while reading for pleasure. Using whole-language activities to supplement phonics instruction certainly helps to make reading fun and meaningful for children, so no one would want to see such tools discarded. Indeed, recent work has indicated—and many teachers have discovered—that the combination of literature-based instruction and phonics is more powerful than either method used alone.

Teachers obviously need to strike a balance. But in doing so, we urge them to remember that reading must be grounded in a firm understanding of the connections between letters and sounds. Instructors should recognize the ample evidence that youngsters who are directly taught phonics become better at reading, spelling and comprehension than those who must pick up all the confusing rules of English on their own. Educators who deny this reality are neglecting decades of research. They are also neglecting the needs of their students.

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KEITH RAYNER, BARBARA R. FOORMAN, CHARLES A. PERFETTI, DAVID PESETSKY and *MARK S. SEIDENBERG* collaborated on a paper surveying the teaching of reading for the November 2001 issue of *Psychological Science in the Public Interest* [see "More to Explore," on page 25]. Rayner, Distinguished Professor of Psychology at the University of Massachusetts at Amherst, is currently on sabbatical in England at the University of Durham. Foorman is a professor of pediatrics at the University of Texas–Houston Health Science Center, where she directs the Center for Academic and Reading Skills. Perfetti is University Professor of Psychology and Linguistics at the University of Pittsburgh, where he is associate director of the Learning Research and Development Center. Pesetsky is Ferrari P. Ward Professor of Linguistics at the Massachusetts Institute of Technology. Seidenberg is a professor of psychology at the University of Wisconsin–Madison.

U.S. Government Studies Supporting Phonics Instruction

Title: Preventing Reading Difficulties in Young Children.
National Academy of Sciences/National Research Council
(sponsored by the Department of Education); 1998

A literature review covering more than 700 publications.

SUMMARY STATEMENT: "Failure to grasp that written spellings systematically represent the sounds of spoken words makes it difficult not only to recognize printed words but also to understand how to learn and to profit from instruction. If a child cannot rely on the alphabetic principle, word recognition is inaccurate or laborious and comprehension of connected text will be impeded."

Title: Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction.
National Reading Panel (convened by the National Institute of Child Health and Human Development, in consultation with the secretary of education); 2000

Includes a meta-analysis of 38 controlled studies of phonics instruction published since 1970

SUMMARY STATEMENT: "The meta--analysis indicated that systematic phonics instruction enhances children's success in learning to read and that systematic phonics instruction is significantly more effective than instruction that teaches little or no phonics."

More to Explore

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Learning to Read: The Great Debate. Jeanne S. Chall. Harcourt Brace, 1996.
Preventing Reading Difficulties in Young Children. Edited by C. E. Snow et al. National Academy Press, 1998. Available at books.nap.edu/books/030906418X/html/index.html
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Keith Rayner, Barbara R. Foorman, Charles A. Perfetti, David Pesetsky and Mark S. Seidenberg in *Psychological Science in the Public Interest,* Vol. 2, No. 2, pages 31–74; November 2001. Available at **www.psychologicalscience.org/newsresearch/publications/journals/ pspi2_2.html**