AMERICAN
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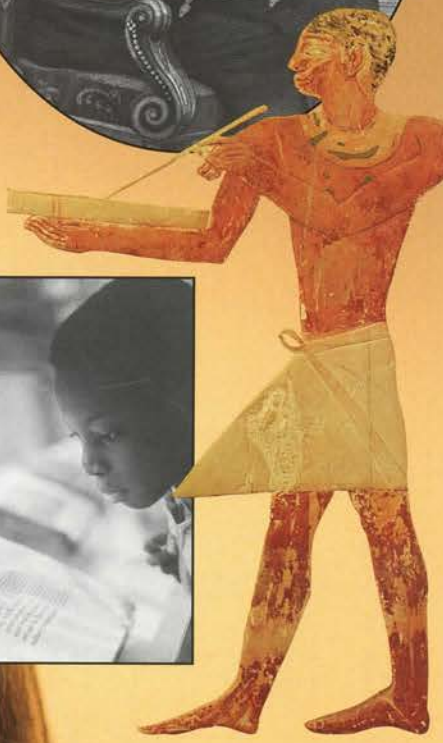
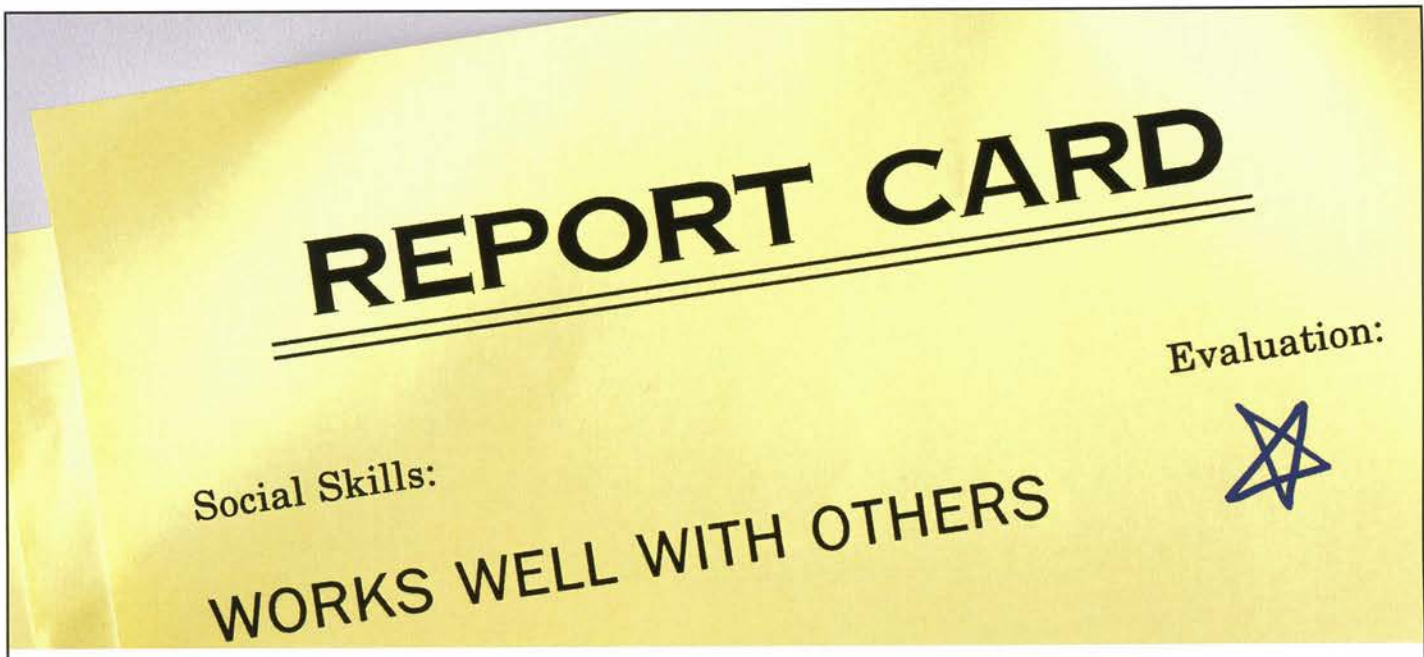
The Unique Power of Reading and How To Unleash It



AMERICAN FEDERATION OF TEACHERS
SPRING/SUMMER 1998



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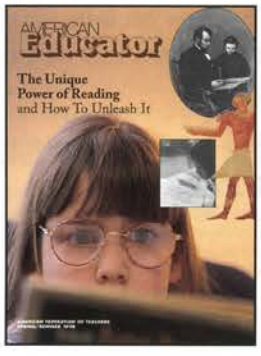

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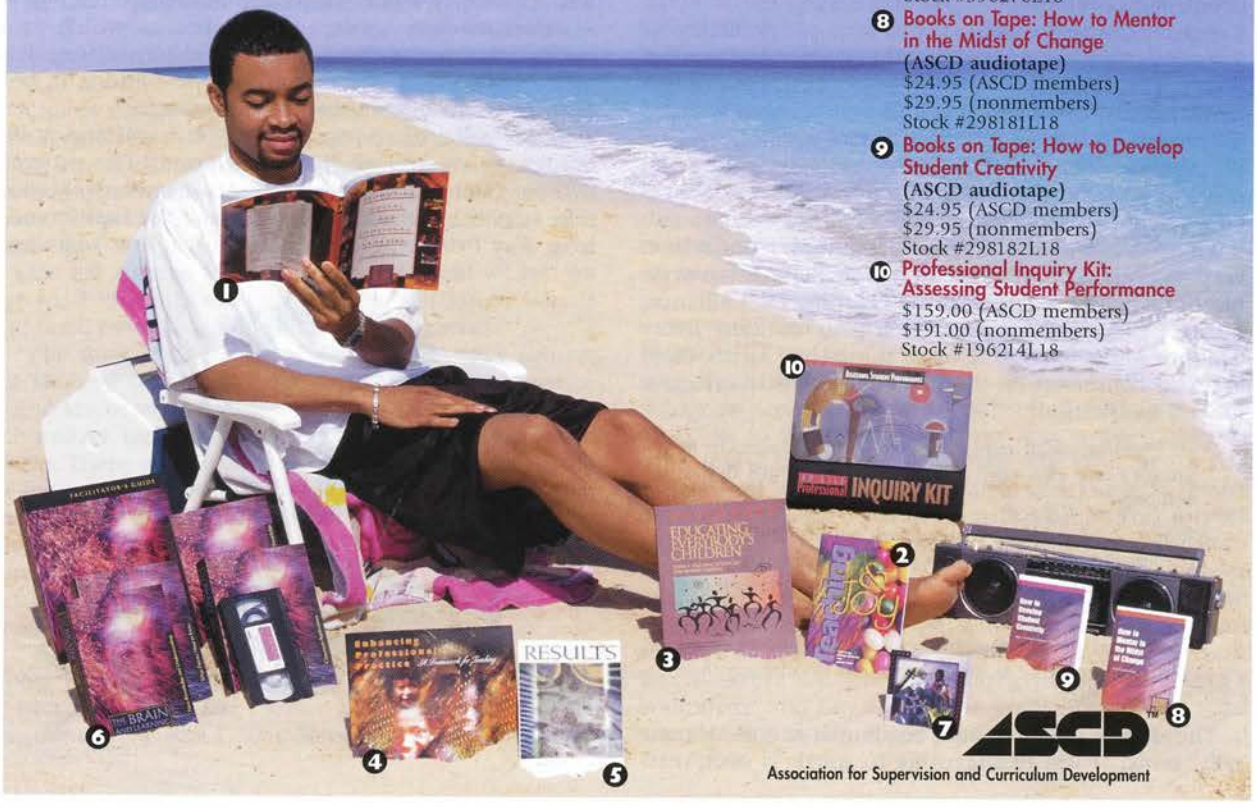

Association for Supervision and Curriculum Development

The Unique Power of Reading And How To Unleash It

"READING IS the most complex of human functions," Sally E. Shaywitz of Yale Medical School recently observed, and in this issue of *American Educator* we explore some of that complexity. We do so against a promising backdrop of policy developments across the country. From the very Office of the President of the United States, and resounding through numerous states and school districts, the goal of having every child able to read with competence and confidence has become a national priority. This recognition of the centrality of the issue—and of the obstacles we face—is unparalleled in the history of the country and represents a display of political will that offers us a tremendous opportunity.

However, political will, as necessary as it is, is not sufficient. It must be joined by an unyielding commitment to base literacy instruction on the large body of research available to us. And here again there are promising developments. Just this spring, the National Research Council (NRC) of the National Academy of Sciences completed a review and synthesis of reading research and issued a report that sets forth the components needed to ensure that children become successful readers. The elements of effective reading instruction are not a matter of opinion or ideology; like good medical practice, reading instruction can rest on a secure scientific base, says the NRC report.

There was more action on the policy front when, very recently, a broad range of national education organizations, acting together as the Learning First Alliance, finished their work on an "action plan" entitled "Every Child Reading." [See p. 52-63 of this issue.] Again, there is broad consensus on the major elements of effective literacy instruction:

"▪ All children need explicit, systematic instruction in phonics and exposure to rich literature, both fiction and non-fiction.

▪ While children need instruction in phonics in early reading development, even then, attention to meaning, comprehension strategies, language development, and writing are essential.

▪ At all times, developing children's interest and pleasure in reading must be as much a focus as developing their reading skills."

The debate over whether reading is acquired "naturally," more or less like learning to speak, is over; reading requires explicit instruction. The debate over what role skilled decoding plays in reading comprehension is over; we know it is central. The debate over whether decoding should be taught systematically or incidentally is over; why leave anything to chance when we can give children an organized, thorough, and efficient grounding in the sound-to-symbol architecture of written language. And for almost everyone, there never was, or never should have been, any debate about the need to immerse children in good literature, attend to meaning right from the start, integrate writing at every stage, and involve students in a wide array of engaging print activities.

AS THE political will to see that every child becomes a successful reader converges with a solid research base to guide our efforts, we are witnessing the confluence of two powerful forces. But we are not yet home free. As Marilyn Jager Adams, the renowned reading researcher, recently wrote, "...the extent to which these policy initiatives will have an actual impact on classroom instruction is a separate issue—and it is only changes in the classroom that really matter."

She is right, of course. The political will and policy consensus are tremendously important. The progress that has been made on these fronts in a relatively short time is nothing short of phenomenal. We have come a long way from where we were just a few years ago.

But we are not yet where we need to be. I was reminded of this recently when I read an article about a special education teacher whose own son was having serious problems learning to read. The methods the school district was using to help her son were not working. Never having been exposed to the current reading research herself, it took this teacher/mother two years to wade through the literature and finally track down the kind of work reported on in this issue. Her son learned to read, but the two lost years were critical ones in his development.

This must never happen again. We must find ways to ensure that research based on scientific principles reaches those on the front lines of education. Teachers must be trained in the best research, they must have abundant opportunity to witness and be supported in good practice, and they must have at their disposal research-based instructional materials that they can use with confidence and success.

It was with that need in mind that we planned this issue of *American Educator*. On a series of key topics, we have attempted to bridge the gap between research and practice. What, for example, is this elusive element, the phoneme? Why has the lack of phonemic awareness blocked the doorway to reading for so many children, and how can we remedy that situation? And how can we identify and help those children who seem headed for trouble in reading *before* they fall behind? And here's a pivotal question: We know that skilled decoding is central to success in reading, but this renewed attention to decoding won't amount to much unless it is taught well, which it now typically is not. How can we avoid not only the problems found in whole-language programs but also the confusion and inefficiency that mars most traditional phonics programs? And, moving ahead a few years, what do we do about the all-too-familiar problem that plagues middle school and beyond: students' eyes glazing over as they face yet another impenetrable page of social studies text. How can we get them to dig in and pull real meaning from that text? And how can we help—actually, *save* is not too strong a word here—the ninth-grade student who is reading at a third-grade level? Finally, we offer a proven, homemade idea for getting books, books, and more books into the hands and homes of our students.

Some of these articles take up complex issues. We do not shy away from that complexity. Successfully ushering children into a sophisticated, literate society like ours, teaching them to deal with all kinds of text, and finding the motivational levers that will turn them into avid readers are jobs for experts. These articles offer a glimpse of the large body of knowledge and skills that must be mastered. In acknowledging the complexity of the teaching task, we pay homage to those who carry it out.

SPREAD THROUGHOUT this issue you will find images that express, better than we can in words, why we care so passionately about securing the everyday details of teaching reading. Here you will see reading's extraordinary power: the mesmerizing, lost-in-a-book magic of reading; the joys of shared reading; the poignancy of intergenerational reading; the avid reader, reading in every odd place, grabbing every opportunity; the solitary scholar; the community of readers; reading over the ages, across time and history and cultures; reading as consolation for old age and as an antidote for boredom and hard labor; reading as the centerpiece of education and the key that unlocks humanity's storehouse of recorded knowledge; reading in confinement, helping the spirit stay alive though the body be imprisoned.

Beginning and ending this issue of *American Educator* are two overarching articles, "What Reading Does for the Mind" and "What Reading Does for the Soul." I'll leave Annie Dillard for your enjoyment, but I would like to say a few words about the first article, which describes the profound cognitive effects that reading has. Reading is a complex undertaking that requires a lot from the reader; but, like good art, its demands are more than matched by what it gives in return. Each time a person reads, he not only takes in the particular passage that confronts him, he also builds his cognitive abilities in a number of ways. I'll leave the details of how this process unfolds to the authors. Suffice it to say, they bring us very good news: Reading has cascading consequences for the mind; importantly, this reading dynamic is democratic in character. Everyone without serious intellectual impairment can learn to read, and everyone who then exercises that ability will be a beneficiary of reading's unique power.

We can unleash that power. We know how. We must not let up until the job is done.

—Editor

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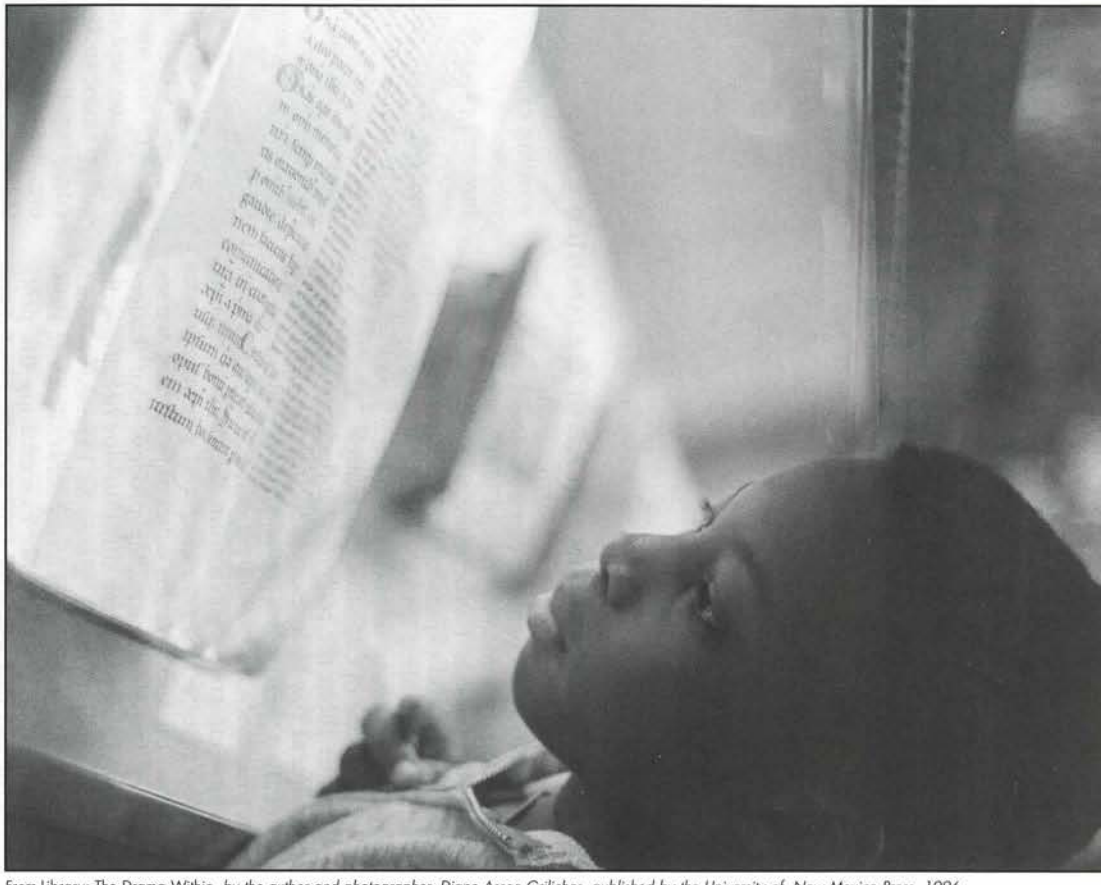

From Library: The Drama Within, by the author and photographer, Diane Asseo Griliches, published by the University of New Mexico Press, 1996

WHAT READING DOES FOR THE MIND

BY ANNE E. CUNNINGHAM AND KEITH E. STANOVICH

READING HAS cognitive consequences that extend beyond its immediate task of lifting meaning from a particular passage. Furthermore, these consequences are reciprocal and exponential in nature. Accumulated over time—spiraling either upward or downward—they carry profound implications for the development of a wide range of cognitive capabilities.

Concern about the reciprocal influences of reading achievement has been elucidated through discussions of so-called "Matthew effects" in academic achievement (Stanovich, 1986; Walberg & Tsai, 1983). The term "Matthew effects" is taken from the Biblical passage that describes a rich-get-richer and poor-get-poorer phenomenon. Applying this concept to reading, we see that very early in the reading process poor readers, who experience greater difficulty in breaking the spelling-to-sound code, begin to be exposed to much less text than their more skilled peers (Allington, 1984; Biemiller, 1977-1978). Further exacerbating the problem is the fact that less-skilled readers often find themselves in materials that are too difficult for them (Allington, 1977, 1983, 1984; Gambrell, Wilson, & Gantt, 1981). The combination of deficient decoding skills, lack of practice, and difficult materials results in unrewarding early reading experiences that lead to less involvement in reading-related activities. Lack of exposure and practice on the part of the less-skilled reader delays the development of automaticity and speed at the word recognition level. Slow, capacity-draining word recognition processes require cognitive resources that should be allocated to comprehension. Thus, reading for meaning is hindered; unrewarding reading experiences multiply; and practice is avoided or merely tolerated without real cognitive involvement.

The disparity in the reading experiences of children of varying skill may have many other consequences for their future reading and cognitive development. As skill develops and word recognition becomes less resource demanding and more automatic, more general language skills, such as vocabulary, background knowledge, familiarity with complex syntactic structures, etc., become the limiting factor on reading ability (Chall, 1983; Sticht, 1979). But the sheer volume of reading done by the better reader has the potential to provide an advantage even here if—as our research suggests—reading a lot serves to develop these very skills and knowledge bases (Cunningham & Stanovich, 1997; Echols, West, Stanovich, & Zehr, 1996; Stanovich & Cunningham, 1992, 1993). From the standpoint of a reciprocal model of reading development, this means that many cognitive differences observed between readers of differing skill may in fact be consequences of *differential practice* that itself resulted from early differences in the *speed* of initial reading acquisition. The increased reading experiences of children who master the spelling-to-sound code early thus might have important positive feedback effects that are denied the slowly progressing reader. In our research, we have begun to explore these reciprocal effects by examining the role that reading volume plays in shaping the mind and will share many of our findings in this article.

We should say at the outset that the complexity of some of the work we will describe in this article was necessitated in large part by the fact that it is difficult to tease apart the unique contribution that reading volume affords. One of the difficulties is that levels of reading volume are correlated with many other cogni-

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Anne E. Cunningham is visiting associate professor in cognition and development in the graduate school of education at the University of California, Berkeley. Her research examines the cognitive and motivational processes that underlie reading ability and the cognitive consequences of reading skill and engagement. Keith E. Stanovich is professor of applied psychology at the University of Toronto/Ontario Institute for Studies in Education. His recent awards include the Sylvia Scribner Award from the American Educational Research Association and the Oscar S. Causey Award from the National Research Conference for his distinguished and substantial contributions to literacy research.

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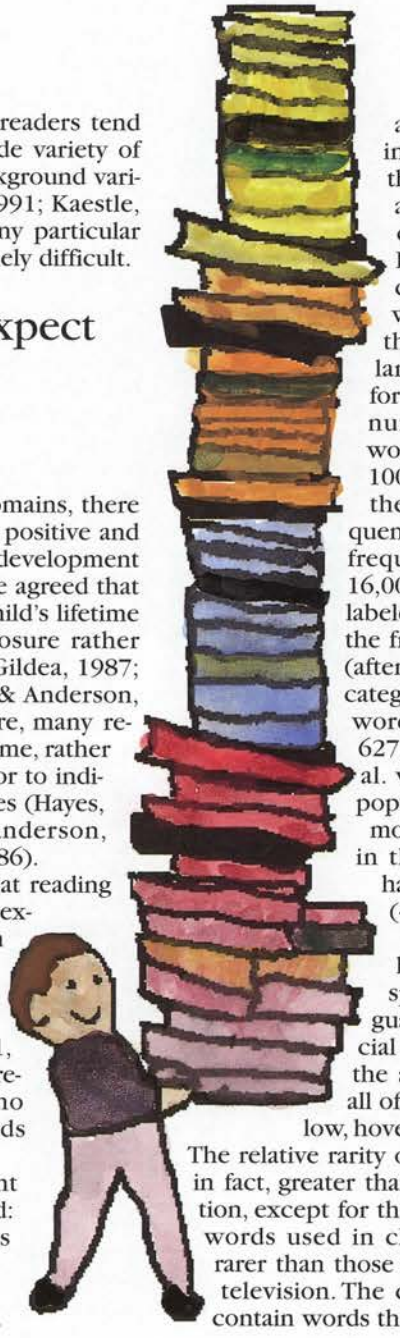
tive and behavioral characteristics. Avid readers tend to be different from nonreaders on a wide variety of cognitive skills, behavioral habits, and background variables (Guthrie, Schafer, & Hutchinson, 1991; Kaestle, 1991; Zill & Winglee, 1990). Attributing any particular outcome to reading volume is thus extremely difficult.

Theoretical Reasons To Expect Positive Cognitive Consequences from Reading Volume

In certain very important cognitive domains, there are strong theoretical reasons to expect a positive and unique effect of avid reading. Vocabulary development provides a case in point. Most theorists are agreed that the bulk of vocabulary growth during a child's lifetime occurs indirectly through language exposure rather than through direct teaching (Miller & Gildea, 1987; Nagy & Anderson, 1984; Nagy, Herman, & Anderson, 1985; Sternberg, 1985, 1987). Furthermore, many researchers are convinced that reading volume, rather than oral language, is the prime contributor to individual differences in children's vocabularies (Hayes, 1988; Hayes & Ahrens, 1988; Nagy & Anderson, 1984; Nagy & Herman, 1987; Stanovich, 1986).

The theoretical reasons for believing that reading volume is a particularly effective way of expanding a child's vocabulary derive from the differences in the statistical distributions of words that have been found between print and oral language. Some of these differences are illustrated in Table 1, which displays the results of some of the research of Hayes and Ahrens (1988), who have analyzed the distributions of words used in various contexts.

The table illustrates the three different categories of language that were analyzed: written language sampled from genres as difficult as scientific articles and as simple as preschool books; words spoken on television shows of various types; and adult speech in two contexts varying in formality. The words used in the different contexts were analyzed according to a standard frequency count of English (Carroll, Davies, & Richman, 1971). This frequency count ranks the 86,741 different word forms in English according to their frequency of occurrence in a large corpus of written English. So, for example, the word "the" is ranked number 1, the 10th most frequent word is "it," the word "know" is ranked 100, the word "pass" is ranked 1,000, the word "vibrate" is 5,000th in frequency, the word "shrimp" is 9,000th in frequency, and the word "amplifier" is 16,000th in frequency. The first column, labeled Rank of Median Word, is simply the frequency rank of the average word (after a small correction) in each of the categories. So, for example, the average word in children's books was ranked 627th most frequent in the Carroll et al. word count; the average word in popular magazines was ranked 1,399th most frequent; and the average word in the abstracts of scientific articles had, not surprisingly, a very low rank (4,389).



What is immediately apparent is how lexically impoverished is most speech, as compared to written language. With the exception of the special situation of courtroom testimony, the average frequency of the words in all of the samples of oral speech is quite low, hovering in the 400-600 range of ranks. The relative rarity of the words in children's books is, in fact, greater than that in all of the adult conversation, except for the courtroom testimony. Indeed, the words used in children's books are considerably rarer than those in the speech on prime-time adult television. The categories of adult reading matter contain words that are two or three times rarer than

Table 1

Selected Statistics for Major Sources of Spoken and Written Language (Sample Means)

		Rank of Median Word	Rare Words per 1000
I.	Printed texts		
	Abstracts of scientific articles	4389	128.0
	Newspapers	1690	68.3
	Popular magazines	1399	65.7
	Adult books	1058	52.7
	Comic books	867	53.5
	Children's books	627	30.9
	Preschool books	578	16.3
II.	Television texts		
	Popular prime-time adult shows	490	22.7
	Popular prime-time children's shows	543	20.2
	Cartoon shows	598	30.8
	Mr. Rogers and *Sesame Street*	413	2.0
III.	Adult speech		
	Expert witness testimony	1008	28.4
	College graduates to friends, spouses	496	17.3

Adapted from Hayes and Ahrens (1988).

those heard on television.

These relative differences in word rarity have direct implications for vocabulary development. If most vocabulary is acquired outside of formal teaching, then the only opportunities to acquire new words occur when an individual is exposed to a word in written or oral language that is outside his current vocabulary. That this will happen vastly more often while reading than while talking or watching television is illustrated in the second column of Table 1. The column lists how many rare words per 1000 are contained in each of the categories. A rare word is defined as one with a rank lower than 10,000; roughly a word that is outside the vocabulary of a fourth to sixth grader. For vocabulary growth to occur after the middle grades, children must be exposed to words that are rare by this definition. Again, it is print that provides many more such word-learning opportunities. Children's books have 50 percent more rare words in them than does adult prime-time television and the conversation of college graduates. Popular magazines have roughly three times as many opportunities for new word learning as does prime-time television and adult conversation. Assurances by some educators that "What they read and write may make people smarter, but so will any activity that engages the mind, including interesting conversation" (Smith, 1989) are overstated, at least when applied to the domain of vocabulary learning. The data in Table 1 indicate that conversation is not a substitute for reading.

Table 2

Examples of words that do not appear in two large corpora of oral language (Berger, 1977; Brown, 1984) but that have appreciable frequencies in written texts (Carroll, Davies & Richman, 1971; Francis & Kucera, 1982):

display	literal
dominance	legitimate
dominant	luxury
exposure	maneuver
equate	participation
equation	portray
gravity	provoke
hormone	relinquish
infinite	reluctantly
invariably	

It is sometimes argued or implied that the type of words present in print but not represented in speech are unnecessary words—jargon, academic doublespeak, elitist terms of social advantage, or words used to maintain the status of the users but that serve no real functional purpose. A consideration of the frequency distributions of written and spoken words reveals this argument to be patently false. Table 2 presents a list of words that do not occur at all in two large *corpora* of oral language (Berger, 1977; Brown, 1984), but that have appreciable frequencies in a written frequency count (Francis & Kucera, 1982). The words *participation, luxury, maneuver, provoke, reluctantly, relinquish, portray, equate, hormone, exposure, display, invariably, dominance, literal, legitimate,* and *infinite* are not unnecessary appendages, concocted to exclude those who are unfamiliar with them. They are words that are necessary to make critical distinctions in the physical and social world in which we live. Without such lexical tools, one will be severely disadvantaged in attaining one's goals in an advanced society such as ours. As Olson (1986) notes:

> It is easy to show that sensitivity to the subtleties of language are crucial to some undertakings. A person who does not clearly see the difference between an expression of intention and a promise or between a mistake and an accident, or between a falsehood and a lie, should avoid a legal career or, for that matter, a theological one.

The large differences in lexical richness between speech and print are a major source of individual differences in vocabulary development. These differences are created by the large variability among children in exposure to literacy. Table 3 presents the data from a study of the out-of-school time use by fifth graders conducted by Anderson, Wilson, and Fielding (1988). From diaries that the children filled out daily over several months' time, the investigators estimated how many minutes per day that individuals were engaged in reading and other activities while not in school. The table indicates that the child at the 50th percentile in amount of independent reading was reading approximately 4.6 minutes per day, or about a half an hour per week, over six times as much as the child at the 20th percentile in amount of reading time (less than a minute daily). Or, to take another example, the child at the 80th percentile in amount of independent reading time (14.2 minutes) was reading over twenty times as much as the child at the 20th percentile.

Anderson et al. (1988) estimated the children's read-

ing rates and used these, in conjunction with the amount of reading in minutes per day, to extrapolate a figure for the number of words that the children at various percentiles were reading. These figures, presented in the far right of the table, illustrate the enormous differences in word exposure that are generated by children's differential proclivities toward reading. For example, the average child at the 90th percentile reads almost two million words per year outside of school, more than 200 times more words than the child at the 10th percentile, who reads just 8,000 words outside of school during a year. To put it another way, the entire year's out-of-school reading for the child at the 10th percentile amounts to just two days reading for the child at the 90th percentile! These dramatic differences, combined with the lexical richness of print, act to create large vocabulary differences among children.

Examining the Consequences of Differential Degrees of Reading Volume

It is one thing to speculate on how these differences in reading volume may result in specific cognitive consequences in domains like vocabulary; it is another to demonstrate that these effects are occurring. In our research, we have sought empirical evidence for the specific effects of reading volume, effects that do not simply result from the higher cognitive abilities and skills of the more avid reader. Although there are considerable differences in amount of reading volume in school, it is likely that differences in *out*-of-school reading volume are an even more potent source of the rich-get-richer and poor-get-poorer achievement patterns. Therefore, we have sought to examine the unique contribution that independent or out-of-school reading makes toward reading ability, aspects of verbal intelligence, and general knowledge about the world. As part of this research program, our research group has pioneered the use of a measure of reading volume that has some unique advantages in investigations of this kind (Cunningham and Stanovich, 1990; Stanovich and West, 1989).

Table 3

Variation in Amount of Independent Reading

%	Independent Reading Minutes Per Day	Words Read Per Year
98	65.0	4,358,000
90	21.1	1,823,000
80	14.2	1,146,000
70	9.6	622,000
60	6.5	432,000
50	4.6	282,000
40	3.2	200,000
30	1.3	106,000
20	0.7	21,000
10	0.1	8,000
2	0.0	0

Adapted from Anderson, Wilson, and Fielding (1988).

In all, we developed two measures of adults' reading volume and one for children's reading volume. Briefly, the children's measure, named the Title Recognition Test (TRT), requires children to pick out the titles of popular children's books from a list of titles that includes equal numbers of made-up titles. This task is easy to administer to large numbers of children, it does not make large cognitive demands, and its results are reliable—it is not possible for children to distort their responses toward what they perceive as socially desirable answers. Because the number of wrong answers can be counted against correct ones, it is possible to remove the effects of guessing from the results (see Cunningham & Stanovich, 1990; 1991; and Stanovich and West, 1989 for a full description of these instruments and a discussion of the logic behind them). The adults' measures, named the Author Recognition and Magazine Recognition Test, have the same task requirements and are described fully in Stanovich and West (1989).

A score on the Title Recognition Test, of course, is not an absolute measure of children's reading volume and previous literacy experiences, but it does provide us with an index of the *relative* differences in reading volume. This index enables us to ask what effects reading volume (rather than general reading comprehension and word decoding ability) has on intelligence, vocabulary, spelling, and children's general knowledge. In short, it enables us to ask the question, does reading—in and of itself—shape the quality of our mind?

The titles appearing on the TRT were selected from a sample of book titles generated in pilot investigations by groups of children ranging in age from second grade through high school. In selecting the items that appear on any one version of the TRT, an attempt was made to choose titles that were not prominent parts of classroom reading activities in these particular schools. Because we wanted the TRT to probe out-of-school rather than school-directed reading, an attempt was made to choose titles that were not used in the school curriculum.

In our technical reports on this work, we have used a powerful statistical technique known as *hierarchical multiple regression* to solve the interpretive problem that avid readers excel in most domains of verbal learning and that, therefore, our measures of reading volume might be spuriously correlated to a host of abilities (Cunningham & Stanovich, 1990, 1991; Stanovich & Cunningham, 1992, 1993; Stanovich & West, 1989). We have found that even when performance is statistically equated for reading comprehension and general ability, reading volume is still a very powerful predictor of vocabulary and knowledge differences. Thus, we believe that reading volume is not simply an indirect indicator of ability; it is actually a potentially separable, independent source of cognitive differences.

Reading Volume as a Contributor to Growth in Verbal Skills

In several studies, we have attempted to link children's reading volume to specific cognitive outcomes after controlling for relevant general abilities such as IQ. In a study of fourth-, fifth-, and sixth-grade children,

we examined whether reading volume accounts for differences in vocabulary development once controls for both general intelligence and specific verbal abilities were invoked (Cunningham & Stanovich, 1991). We employed multiple measures of vocabulary and controlled for the effects of age and intelligence. We also controlled for the effect of another ability that may be more closely linked to vocabulary acquisition mechanisms: decoding ability. Decoding skill might mediate a relationship between reading volume and a variable like vocabulary size in numerous ways. High levels of decoding skill, certainly a contributor to greater reading volume, might provide relatively complete contexts for figuring out the meaning of words during reading. Thus, reading volume and vocabulary might be linked via their connection to decoding ability: Good decoders read a lot and have the best context available for inferring new words. This potential linkage was accounted for by statistically controlling for decoding ability prior to investigating reading volume. But we found that even after accounting for general intelligence and decoding ability, reading volume contributed significantly and independently to vocabulary knowledge in fourth-, fifth-, and sixth-grade children.

These findings demonstrate that reading volume, although clearly a consequence of developed reading ability, is itself a significant contributor to the development of other aspects of verbal intelligence. Such rich-get-richer (and of course their converse, poor-get-poorer) effects are becoming of increasing concern in the educational community (Adams, 1990; Chall, 1989) and are playing an increasingly prominent role in theories of individual differences in reading ability and growth (Anderson, et al., 1988; Chall, Jacobs, & Baldwin, 1990; Hayes, 1988; Hayes & Ahrens, 1988; Juel, 1988, 1994; Stanovich 1986, 1989, 1993).

In a study we conducted involving college students, we employed an even more stringent test of whether reading volume is a unique predictor of verbal skill (Stanovich & Cunningham, 1992). In this study we examined many of the same variables as in our study of fourth- to sixth-grade students. However, we decided to stack the deck against reading volume by first removing any contribution of reading ability and general intelligence. By structuring the analyses in this way, we did not mean to imply that reading volume is not a determinant of reading comprehension ability. Indeed, we argue that there *are* grounds for believing that reading volume facilitates growth in comprehension ability. However, we wanted to construct the most conservative analysis possible by deliberately allowing the comprehension measure to steal some variance that is rightfully attributed to the measure of reading volume. The results of our study again attest to the potency of reading volume. We found that reading volume made a significant contribution to multiple measures of vocabulary, general knowledge, spelling, and verbal fluency even after reading comprehension ability and nonverbal ability had been partialed out.

One way of demonstrating the conservative nature of these analyses is illustrated in a longitudinal study that we have conducted (Cipielewski & Stanovich, 1992). We addressed the question of whether reading volume can predict individual differences in *growth* in reading comprehension from third grade to fifth grade. We found that reading volume predicted variance in fifth-grade reading comprehension ability after third-grade reading comprehension scores had been removed. Thus, in removing the contribution of reading comprehension in our adult studies, we are undoubtedly removing some of the variance in variables such as vocabulary and general knowledge that is rightfully attributed to reading volume.

Reading Volume and Declarative Knowledge

In other studies, we have focused even more directly on content knowledge by addressing the issue of "Where Does Knowledge Come From?". Stanovich and Cunningham (1993) examined general ability, reading volume, and exposure to other media sources as determinants of individual differences in content knowledge. This study contained a particularly stringent test of the role of reading volume and individual differences in knowledge acquisition among 268 college students. We administered five different measures of general knowledge to the students. Then we stacked the deck against reading volume once again by statistically entering four measures of general ability before looking at the contribution of reading volume: high school grade-point average, performance on an intelligence test, an SAT-type mathematics test, and an adult reading comprehension test. This set of tasks surely exhausts the variance attributable to any general ability construct; and, as one would expect, we found that general ability accounted for a substantial proportion of variance in the composite measure of general knowledge. Next we entered a composite measure of exposure to television, but it did not account for any additional variance. However, a composite index of reading volume accounted for a substantial 37.1 percent of the variance when entered after the four ability measures and television exposure.

This pattern was replicated in each of the five measures of general knowledge we employed, including a homemade instrument we called the Practical Knowledge Test. This task was designed to address the criticism that our other measures of general knowledge were too academic—that they tapped knowledge that was too esoteric or elitist and that was not useful in daily life. We didn't think this was true; many items on these measures were mundane and concrete questions such as, "In what part of the body does the infection called pneumonia occur?" Nevertheless, in the Practical Knowledge Test, we made an effort to devise questions that were directly relevant to daily living in a technological society in the late twentieth century; for example, What does the carbure-

tor in an automobile do? If a substance is carcinogenic, it means that it is _____? After the Federal Reserve Board raises the prime lending rate, the interest that you will be asked to pay on a car loan will generally increase/decrease/stay the same? What vitamin is highly concentrated in citrus fruits? When a stock exchange is in a "bear market," what is happening? and so forth.

The results indicated that the more avid readers in our study—regardless of their general abilities—knew more about how a carburetor worked, were more likely to know who their United States senators were, more likely to know how many teaspoons are equivalent to one tablespoon, were more likely to know what a stroke was, and what a closed shop in a factory was, etc. One would be hard pressed to deny that at least some of this knowledge is relevant to living in the United States in the late 20th century.

In other questions asked of these same students, we attempted to probe areas that we thought might be characterized by *mis*information. We then attempted to trace the "cognitive anatomy" of this misinformation. One such question concerned the sizes of the world's major religions and was designed to assess awareness of the multicultural nature of the modern world. The question was phrased as follows: "The 1986 *Encyclopedia Britannica* estimates that there are approximately nine hundred million people in the *world* (not just the United States) who identify themselves as Christians. How many people in the world (not just the United States) do you think identify themselves as _____?" Space was then provided on the form for the subjects to make estimates of the number of Moslems, Jews, Buddhists, Hindus, etc.

We will focus here on the estimates of Moslem and Jewish people because of our *a priori* hypothesis that availability effects caused by televised coverage of Israel in the U.S. had skewed the perception of this ratio. While our sample's median estimate of the number of Jewish people (20 million) was quite close to the actual figure of 18 million according to the 1990 *Universal Almanac,* the number of estimated Moslems—a mean of 10 million—was startlingly low (817 million is the estimate in the *Universal Almanac*). For each participant in our study, we calculated the ratio of the Moslem to Jewish estimates to see how many students were aware of the fact that the number of Moslems is an order of magnitude larger (the actual estimated ratio is approximately 33:1 according to the *World Almanac*; 45:1 according to the *Universal Almanac*). The median ratio in our sample was 0.5. That is, 69.3 percent of our sample thought that there were more Jewish people in the world than Moslems.

This level of inaccuracy is startling given that approximately 40 percent of our sample of 268 students were attending one of the most selective public institutions of higher education in the United States (the University of California, Berkeley). We have explored the correlates of this particular misconception in a variety of ways. We looked at the performance on this question as a function of students' level of reading volume and television watching. We observed a clear effect of reading volume on the scores on the question and a significant effect of television viewing, but the effects were in opposite directions! Reading volume was associated with higher scores on the question, but television exposure was associated with lower scores. Scores among the group high in reading volume and low in television exposure were highest, and the lowest scores were achieved by those high in television exposure and low in reading volume. Our analyses confirmed that these relationships were not due to differences in general ability.

Similarly, we have analyzed a variety of other misconceptions in a number of other different domains—including knowledge of World War II, the world's languages, and the components of the federal budget—and all of them replicate the pattern shown for this question. The cognitive anatomy of misinformation appears to be one of too little exposure to print (or reading) and over-reliance on television for information about the world. Although television viewing can have positive associations with knowledge when the viewing is confined to public television, news, and/or documentary material (Hall, Chiarello, & Edmondson, 1996; West & Stanovich, 1991; West et al., 1993), familiarity with the primetime television material that defines mass viewing in North America is most often negatively associated with knowledge acquisition.

In another study, Stanovich, West, & Harrison (1995) examined a much older population in order to investigate the extent to which age-related growth in knowledge can be accounted for by differences in reading volume. Although much research effort has been expended on describing cumulative growth in crystallized intelligence (e.g., acquired knowledge such as vocabulary and general information), we know little about the experiences that relate to knowledge growth in older individuals. For example, educational experience (years in school) is a predictor of intellectual functioning in older individuals (e.g., Schwartzman, Gold, Andres, Arbuckle, & Chaikelson, 1987). It is assumed that education (which is received early in life) in part determines the extent and quality of many intellectual activities later in life. And it is presumably this intellectual activity as one ages that is so crucial to the preservation of cognitive capacities. Thus, while considerable development of cognitive skills and abilities can result from formal educational experiences, it is the lifetime *use* of these skills that is assumed to have the beneficial effect.

In this study, Stanovich, et al. (1995) examined the performance of college students and senior citizens on general knowledge, vocabulary, working memory, syllogistic reasoning, and several measures of reading volume. The older individuals outperformed the college students on the measures of general knowledge and vocabulary, but did significantly less well than the college subjects on the working memory and syllogistic reasoning tasks. This dissociation between fluid intelligence (all-purpose general problem-solving capacity) and crystallized intelligence (general knowledge and vocabulary) is a standard finding in the literature (Baltes, 1987; Horn & Hofer, 1992; Salthouse, 1988). However, a series of analyses indicated that when measures of reading volume were used as control variables, the positive relationships between

age and vocabulary and age and declarative knowledge were eliminated (in contrast, the negative relationships between age and fluid abilities were largely unchanged). Thus, the results of this study are consistent with the conjecture that—in the domain of verbal abilities—reading a lot can even help to compensate for the normally deleterious effects of aging! (See also, Smith, 1996.)

How Do We Become Avid Readers?

Moving back again to the other end of the age spectrum, we switch focus to the question: Given that lifelong reading habits are such strong predictors of verbal cognitive growth, what is it that predicts these habits? We've been looking at reading volume as a predictor of reading comprehension and cognitive ability, but what predicts reading volume or avid reading?

It is generally agreed that comprehension ability and reading volume are in a reciprocal relationship. In an attempt to tease apart this reciprocal relationship, we explored the linkages between children's first-grade reading and cognitive abilities and eleventh-grade outcomes in a unique ten-year longitudinal study (Cunningham and Stanovich, 1997). Most of our earlier studies involved assessing contemporaneous relations, but in this study, we examined the performance of a sample of students who had been tested as first graders (see Stanovich, Cunningham, and Feeman, 1984). About one half of these students were available ten years later for testing as eleventh graders. At this time, we administered a set of reading comprehension, cognitive ability, vocabulary, and general knowledge tasks, as well as several measures of reading volume. Additionally, some standardized test scores from the intervening period were available. We were therefore able to examine what variables in the first grade predicted these cognitive outcomes in the eleventh grade. We interpreted the reading volume measures administered in the eleventh grade as cumulative indicators of variance in reading volume that had taken place many years earlier. Thus, we viewed the measures as in some sense retrospective indicators tapping the cumulative experiences and habits of the students some distance in time before actual assessment. As a result, we were able to examine how far this retrospective feature could be stretched.

We addressed the question of whether the *speed* of initial reading acquisition in the first grade could predict later tendencies to engage in reading activities even after differences in general cognitive abilities were controlled, as some models of Matthew effects in educational achievement would predict (Chall, Jacobs, & Baldwin, 1990; Juel, 1994; Stanovich, 1986). We statistically removed the contribution of eleventh-grade reading comprehension ability, in order to remove the direct association between reading volume and current reading ability. Then we examined the contribution of three standardized measures of first grade reading ability (decoding, word recognition, and comprehension) and observed that all three measures predicted eleventh-grade reading volume even after eleventh-grade reading comprehension ability had been partialed out! In contrast, we observed that first-grade intelligence measures do *not* uniquely predict eleventh-grade reading volume in the same way. Thus, this study showed us that an early start in reading is important in predicting a lifetime of literacy experience—and this is true *regardless* of the level of reading comprehension ability that the individual eventually attains.

This is a stunning finding because it means that students who get off to a fast start in reading are more likely to read more over the years, and, furthermore, this very act of reading can help children compensate for modest levels of cognitive ability by building their vocabularly and general knowledge. In other words, ability is not the only variable that counts in the development of intellectual functioning. Those who read a lot will enhance their verbal intelligence; that is, reading will make them smarter.

The Reciprocal Effects of Reading Volume

We can begin to sketch a view of the reciprocal influences of early reading acquisition and reading volume as determinants of later reading comprehension and other cognitive abilities. Early success at reading acquisition is one of the keys that unlocks a lifetime of reading habits. The subsequent *exercise* of this habit serves to further develop reading comprehension ability in an interlocking positive feedback logic (Juel, Griffith, & Gough, 1986; Juel, 1988; Snow, Barnes, Chandler, Goodman, & Hemphill, 1991; Stanovich, 1986, 1993). Although it is difficult to tease apart, we have attempted to trace the increasing divergence in children's reading ability, as well as other cognitive outcomes, by examining both sides of the important role of reciprocal causation. Our longitudinal study has permitted us to observe these effects, whereby children who get out of the gate quickly—who crack the spelling-to-sound code early on—appear to enter into a positive feedback loop. One of the benefits of these reciprocating effects may be a level of participation in literacy activities that leads to a lifetime habit of reading and thus sets the stage for future opportunities—opportunities not enjoyed by children who enter into this feedback loop more slowly.

A positive dimension of our research is that all of our studies have demonstrated that reading yields significant dividends for everyone—not just for the "smart kids" or the more able readers. Even the child with limited reading and comprehension skills will build vocabulary and cognitive structures through reading.

We can thus elicit two crucial messages from our research findings. First, it is difficult to overstate the importance of getting children off to an early successful start in reading. We must ensure that students' decoding and word recognition abilities are progressing solidly. Those who read well are likely to read more, thus setting an upward spiral into motion.

Second, we should provide all children, regardless of their achievement levels, with as many reading experi-

ences as possible. Indeed, this becomes doubly imperative for precisely those children whose verbal abilities are most in need of bolstering, for it is the very act of reading that can build those capacities. An encouraging message for teachers of low-achieving students is implicit here. We often despair of changing our students' abilities, but there is at least one partially malleable habit that will itself develop abilities—reading! □

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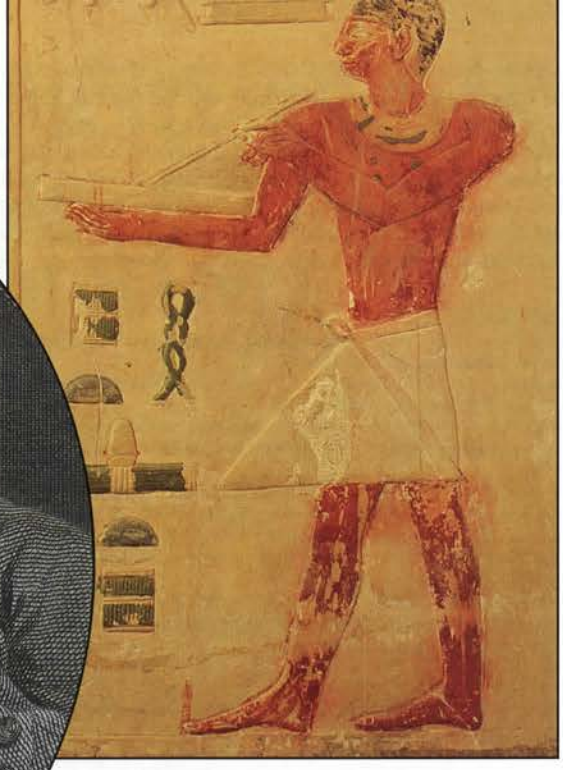
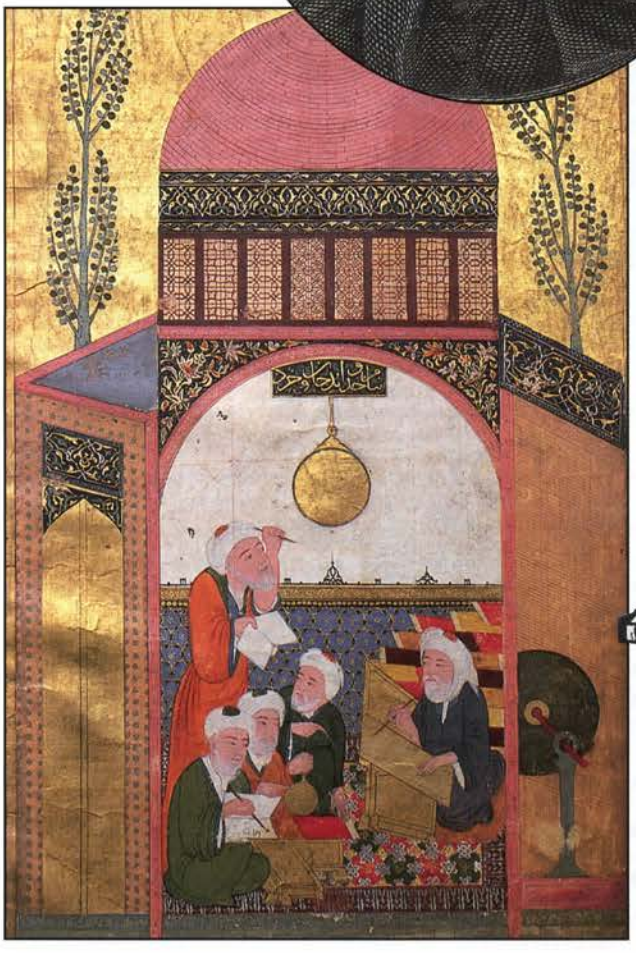
This page, clockwise from top right: Ancient relief in the tomb of Akhti-hoter from Sakkara, Egypt: photographed by Fred J. Maroon / FOLIO, Inc.; An attachable book holder: Corbis-Bettmann; Fifteenth-century students in astronomy from a Persian manuscript: Roland Michaud; Engraving of Dr. Samuel Johnson by John Hall after the painting by Sir Joshua Reynolds: Mary Evans Picture Library. Opposite page, Photo of the tomb of Eleanor of Aquitaine, wife of England's Henry II and mother of England's King Richard the Lionhearted, in the Abbey at Fontevrault, France: Erich Lessing / Art Resource





A young Ben Franklin reads by candlelight: Corbis-Bettmann

THE ELUSIVE PHONEME

Why Phonemic Awareness Is So Important and How To Help Children Develop It

BY MARILYN JAGER ADAMS, BARBARA R. FOORMAN, INGVAR LUNDBERG, AND TERRI BEELER

"Whether performed silently or aloud," Marilyn Adams recently wrote, "reading an alphabetic script with fluency and reflective comprehension incontrovertibly depends on...remarkably rich and overlearned knowledge of the language's spellings and spelling-speech mappings....[But] despite myriad proposals to make it easier, alphabetic instruction has been dogged by one problem: Many students find it extremely difficult to induce the words from the code, no matter how they are drilled on the individual letters and sounds."

However, she continued, research has now delivered on this fundamental problem: "Research has finally yielded an answer to the question of why learning to use the alphabetic principle is difficult for so many. The impasse lies in the perceptual and conceptual elusiveness of the phonemes."

What is this elusive element, the phoneme? Why has the lack of phonemic awareness blocked the doorway to reading for large numbers of children? And how might we remedy this situation?

We now have good answers to these questions, and we are extremely pleased to be able to share with our readers the following commentary and sample lessons from a new book, Phonemic Awareness in Young Children: A Classroom Curriculum. *This curriculum is an example of what we desperately need more of: research-based theory translated into field-tested materials that teachers can confidently and successfully use in the classroom.*

Walking through the fifty-one suggested lessons in this curriculum, as I have, gives one a window into how children can be brought, step by step, to understand the architecture of their language, and how such understanding prepares them for the most critical academic undertaking of their lives: the mastery of reading and writing. Indeed, one finishes these exercises with a tremendous feeling of optimism, a sense that every child who is successfully led through them—no matter the spareness of that child's home environment—will glide ever so more easily into mastery of the alphabetic code and the door to literacy that it wedges open.

Phonemic Awareness in Young Children *is divided into seven sets of multiple lessons (plus appendices filled with numerous additional activities and support materials):*

- ☐ Listening Games: *To sharpen children's ability to attend selectively to sounds;*
- ☐ Rhyming: *To use rhyme to introduce the children to the sounds of words;*
- ☐ Words and Sentences: *To develop children's awareness that language is made up of strings of words;*
- ☐ Awareness of Syllables: *To develop the ability to analyze words into separate syllables and to synthesize words from a string of separate syllables;*
- ☐ Initial and Final Sounds: *To show the children that words contain phonemes and to introduce them to how phonemes sound and feel when spoken in isolation;*
- ☐ Phonemes: *To develop the ability to analyze words into a sequence of separate phonemes and to synthesize words from a sequence of separate phonemes;*
- ☐ Introducing Letters and Spellings: *To introduce the relation of letters to speech sounds.*

To give you a flavor of how this curriculum can help children grasp the sound-based building blocks

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Marilyn Jager Adams is visiting scholar at Harvard University in Cambridge, Massachusetts. Barbara R. Foorman is professor of pediatrics at the University of Texas Medical School in Houston. Ingvar Lundberg is professor in the department of psychology at Göterborg University in Sweden. Terri Beeler is assistant professor of urban education at the University of Houston's downtown campus.

of their language, we have chosen two lessons from the very first set of activities (Chapter 3), in which children are introduced to the art of listening actively, attentively, and analytically; one lesson from the chapter that teaches children that words are made of strings of smaller units of speech—syllables; three lessons from "Initial and Final Sounds," which introduces the children to the nature and existence of phonemes; and two lessons from the chapter entitled "Phonemes," which builds on the previous work.

Keep in mind that these activities focus on the structure of spoken *language and are preliminary to phonics instruction. Their purpose is to lay the groundwork, prepare the soil, get children ready for instruction in phonics and spelling. Indeed, as the authors note, "Educators...have found that attending to children's phonemic awareness removes phonics from the realm of drill and skill and makes it learnable and interesting to their students."*

The activities in this curriculum were originally developed for use with kindergarten children, but the pace and complexity can be adjusted for use in first grade and special education. The authors recommend that fifteen to twenty minutes per day be devoted to phonemic awareness activities. Of course, as with all instruction, some students may need more intensive support than others.

Phonemic awareness is not a magic bullet. We know there is no single magic bullet for mastering the complex task of reading. But—while research must continue to refine our knowledge and practice in all aspects of phonological processing—there is now widespread consensus that we have zeroed in on an important piece of the puzzle. On behalf of all the children for whom the lack of phonemic awareness has been such a stumbling block in learning to read, we must act.

—Editor

The Nature and Importance of Phonemic Awareness

Before children can make any sense of the alphabetic principle, they must understand that those sounds that are paired with the letters are one and the same as the sounds of speech. For those of us who already know how to read and write, this realization seems very basic, almost transparent. Nevertheless, research shows that the very notion that spoken language is made up of sequences of these little sounds does not come naturally or easily to human beings.

The small units of speech that correspond to letters of an alphabetic writing system are called *phonemes.* Thus, the awareness that language is composed of these small sounds is termed *phonemic awareness.* Research indicates that, without direct instructional support, phonemic awareness eludes roughly 25 percent of middle-class first graders and substantially more of those who come from less literacy-rich backgrounds. Furthermore, these children evidence serious difficulty in learning to read and write (see Adams, 1990, for a review).

Why is awareness of phonemes so difficult? The problem, in large measure, is that people do not attend to the sounds of phonemes as they produce or listen to speech. Instead, they process the phonemes automatically, directing their active attention to the meaning and force of the utterance as a whole. The challenge, therefore, is to find ways to get children to notice the phonemes, to discover their existence and separability. Fortunately, many of the activities involving rhyme, rhythm, listening, and sounds that have long been enjoyed with preschool-age children are ideally suited for this purpose. In fact, with this goal in mind, all such activities can be used more effectively toward helping children to develop phonemic awareness.

The purpose of this book is to provide concrete activities that stimulate the development of phonemic awareness in the preschool or elementary classroom. It is based on a program originally developed and validated by Lundberg, Frost, and Petersen (1988) in Sweden and Denmark. After translating and adapting it for U.S. classrooms, we field tested it with kindergarten students and teachers in two schools receiving Title I funds. We, too, found that kindergartners developed the ability to analyze words into sounds significantly more quickly than kindergartners who did not have this program (Foorman, Francis, Beeler, Winikates, &

Fletcher, 1997; Foorman, Francis, Shaywitz, Shaywitz, & Fletcher, 1997). This ability to analyze words into sounds is exactly the skill that promotes successful reading in first grade (Wagner, Torgesen, & Rashotte, 1994).

What Research Says about Phonemic Awareness

Although a number of different types of linguistic awareness are, in one way or another, presupposed in the dialogues and activities of beginning reading instruction, preschool-age children's awareness of phonemes—of the speech sounds that correspond roughly to individual letters—has been shown to hold singular predictive power, statistically accounting for as much as 50 percent of the variance in their reading proficiency at the end of first grade (Blachman, 1991; Juel, 1991; Stanovich, 1986; Wagner et al., 1994). Furthermore, faced with an alphabetic script, a child's level of phonemic awareness on entering school is widely held to be the strongest single determinant of the success that she or he will experience in learning to read—or, conversely, the likelihood that she or he will fail (Adams, 1990; Stanovich, 1986).

Measures of preschool-age children's level of phonemic awareness strongly predict their future success in learning to read; this has been demonstrated not only among English students but also among Swedish (Lundberg, Olofsson, & Wall, 1980); Norwegian (Høien, Lundberg, Stanovich, & Bjaalid, 1995); Spanish (deManrique & Gramigna, 1984); French (Alegria, Pignot, & Morais, 1982); Italian (Cossu, Shankweiler, Liberman, Tola, & Katz, 1988); Portuguese (Cardoso-Martins, 1995); and Russian students (Elkonin, 1973). Measures of schoolchildren's ability to attend to and manipulate phonemes strongly correlate with their reading success through the twelfth grade (Calfee, Lindamood, & Lindamood, 1973). Poorly developed phonemic awareness distinguishes economically disadvantaged preschoolers from their more advantaged peers (Wallach, Wallach, Dozier, & Kaplan, 1977) and has been shown to be characteristic of adults with literacy problems in the United States (Liberman, Rubin, Duques, & Carlisle, 1985); Portugal (Morais, Cary, Alegria, & Bertelson, 1979); England (Marcel, 1980); and Australia (Byrne & Ledez, 1983). Indeed, among readers of alphabetic languages, those who are successful invariably have phonemic awareness, whereas those who lack phonemic awareness are invariably struggling (Foorman, Francis, Beeler, et al., 1997; Foorman, Francis, Fletcher, Winikates, & Mehta, 1997; Foorman, Francis, Shaywitz, et al., 1997; Stanovich, 1986; Tunmer & Nesdale, 1985).

Knowing that so many children lack phonemic awareness and that phonemic awareness is critical to learning to read and write an alphabetic script, we begin to see the importance of making a place for its instruction. In fact, research clearly shows that phonemic awareness can be developed through instruction, and, furthermore, that doing so significantly accelerates children's subsequent reading and writing achievement (Ball & Blachman, 1991; Blachman, Ball, Black, & Tangel, 1994; Bradley & Bryant, 1983; Byrne & Fielding-Barnsley, 1991, 1993, 1995; Castle, Riach, & Nicholson, 1994; Cunningham, 1990; Lundberg et al., 1988; Wallach & Wallach, 1979; Williams, 1980).

About the Structure of Language

In order to build phonemic awareness in *all* children, classroom teachers should know a little about the structure of language, especially phonology. *Phonology* is the study of the unconscious rules governing speech-sound production. In contrast, *phonetics* is the study of the way in which speech sounds are articulated, and *phonics* is the system by which symbols represent sounds in an alphabetic writing system.

Phonological rules constrain speech-sound production for biological and environmental reasons. Biological constraints are due to the limitations of human articulatory-motor production. For example, humans are not able to produce the high-frequency vocalizations of whales. Other constraints on our ability to produce speech have to do with the way our brains classify and perceive the minimal units of sound that make a difference to meaning—the units we call *phonemes.*

The differences between the sounds of two phonemes are often very subtle: Compare/b/ with /p/. Yet, these subtle differences in sound can signal dramatic differences in meaning: Compare *bat* with *pat.* Fortunately, because phonemes are the basic building blocks of spoken language, babies become attuned to the phonemes of their native language in the first few months of life. However, this sensitivity to the sounds of the phonemes and the differences between them is not conscious. It is deeply embedded in the subattentional machinery of the language system.

Phonemes are also the units of speech that are represented by the letters of an alphabetic language. Thus, developing readers must learn to separate these sounds, one from another, and to categorize them in a way that permits understanding of how words are spelled. It is this sort of explicit, reflective knowledge that falls under the rubric of *phonemic awareness.* Conscious awareness of phonemes is distinct from the built-in sensitivity that supports speech production and reception. Unfortunately, phonemic awareness is not easy to establish.

Part of the difficulty in acquiring phonemic awareness is that, from word to word and speaker to speaker, the sound of any given phoneme can vary considerably. These sorts of variations in spoken form that do *not* indicate a difference in meaning are referred to as *allophones* of a phoneme. For example, in the northern part of the United States, the pronunciation of *grease* typically rhymes with *peace,* whereas in parts of the south, it rhymes with *sneeze.* Similarly, the pronunciations of the vowels vary greatly across regions, dialects, and individuals. Alternatively, variations in spoken form sometimes eliminate phonetic distinctions between phonemes. Thus, for some people, the words *pin* and *pen* are pronounced differently with distinct medial sounds corresponding to their distinct vowels. For other people, however, these words are phonetically indistinguishable, leaving context as the only clue to meaning. Indeed, because of variations in

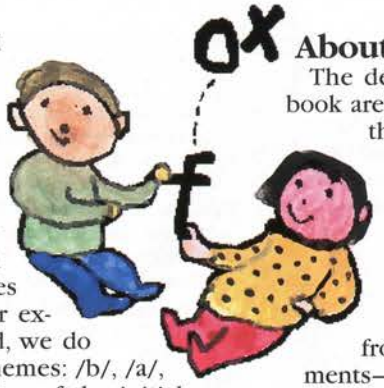
the language, even linguists find it difficult to say exactly how many phonemes there are in English; answers vary from forty-four to fifty-two.

It is also important to note that phonemes are not spoken as separate units. Rather, they are *co-articulated;* that is, when we speak, we fuse the phonemes together into a syllabic unit. For example, when we say *bark* aloud, we do not produce four distinct phonemes: /b/, /a/, /r/, /k/. Instead, our pronunciation of the initial consonant is influenced by the medial vowel, and the medial vowel is influenced by the consonants before and after it. Thus, we talk about *r-controlled vowels* like the "ar" in *bark.* Similarly, we speak of *nasalized vowels* before nasal consonants, such as in the words *and, went,* and *gym.* Because these vowels are assimilated into the following consonant in speech, most children have special difficulty representing them as distinct phonemes in reading and spelling, such that, for example, *went* might be read or spelled as W-E-T.

Consonants as well as vowels are affected by co-articulation. Consider /t/ and /d/. Say the words *write* and *ride.* The /t/ and /d/ sound distinct in these two words. However, now say *writer* and *rider.* Now the medial /t/ and /d/ phonemes are reduced to a common phoneme (called a tongue flap). Not surprisingly, children are likely to spell *writer* as R-I-D-R. Furthermore, /t/ and /d/ are affected by /r/ in consonant blends. Pronounce the following pairs of words: *tuck-truck; task-trash; dunk-drunk; dagger-dragon.* Children notice the change in /t/ and /d/ when followed by /r/ and represent the phonetic detail with spellings of C-H-R-A-N for *train* and J-R-A-G-N for *dragon.*

The phonological awareness activities in this curriculum ask children to listen to the sameness, difference, number, and order of speech sounds. As the previous examples illustrate, such activities can become difficult when the phonetic level of speech does not relate cleanly or directly to the phonemic level. Yet, it is ultimately the phonemic level we are after because it is awareness of phonemes that allows children to understand how the alphabet works—an understanding that is essential to learning to read and spell.

For more information on phonology, we recommend Fromkin and Rodman (1993) and Parker and Riley (1994). For more information on how phonology relates to the teaching and learning of reading and spelling, we recommend Hull (1985), Moats (1995), and Treiman (1993). For more information on how to work with children who have extreme difficulty with speech-sound production, we recommend Lindamood and Lindamood (1975). For further information or assistance in working with these children, we add that speech-language pathologists can be very helpful. Their training provides them with in-depth understanding of phonology as well as expressive and receptive syntax (i.e., the rule system by which words may be ordered in phrases and sentences).



About this Curriculum

The design and sequence of the activities in this book are intended to help children acquire a sense of the architecture of their language and the nature of its building blocks. Thus, across chapters, the children's attention is focused and refocused on smaller and smaller parts, on layers within layers of the language. Gradually, they are led to notice how stories are built from sentences, sentences from words, words from syllables, and syllables themselves from a relatively small set of basic speech elements—phonemes. The children are led to see how, within each layer, the parts can be broken apart, separately spoken, and put back together. They are led to see that if the parts are omitted, substituted, or rearranged, then the whole is altered in sound *and* meaning. They are, in short, led to appreciate the structure of the system.

But that's not all. Over the course of all this structural play, the children also learn how to focus on the parts themselves; this is particularly important at the level of the phonemes. As the children practice synthesizing words from phonemes and analyzing phonemes from words, they are also practicing hearing and saying the phonemes over and over, both in isolation and in context. They are becoming generally familiar with how the different phonemes sound and how they are articulated. They are becoming comfortable with hearing and feeling the identity and distinguishing characteristics of each phoneme, whether spoken in isolation or in the beginning, middle, or end of a variety of words.

Research shows that once children have mastered phonemic awareness in this way, useful knowledge of the alphabetic principle generally follows with remarkable ease—and no wonder: Having learned to attend to and think about the structure of language in this way, the alphabetic principle makes sense. All that's left to make it usable is knowledge of the particular letters by which each sound is represented.

Finally, a note is in order about the adaptations and adjustments that we made in putting together this version of the program. While we made a number of modifications, the most important is the addition of a whole new chapter (Introducing Letters and Spellings). The original program involved oral language play only. As such, the reading/writing advantage evidenced by Lundberg et al.'s (1988) young students offered strong validation of the advantages of training phonological awareness, per se. Yet, the reason for training phonological awareness at all is to make spelling-sound correspondences more learnable when they are taught. In keeping with this philosophy, several more recent studies have demonstrated that the impact of phonemic awareness training on early reading and writing is enhanced still further when spelling-sound correspondences are developed alongside speech-sound correspondences (Ball & Blachman, 1990; Blachman et al., 1994; Byrne & Fielding-Barnsley, 1991, 1993, 1995; Hatcher, Hulme, & Ellis, 1994). It is important to note that doing so does not amount to a reversion to conventional phonics,

for the letter-sound correspondences are not presented for rote memorization in and of themselves. Instead, they are built into the phonemic awareness activities in a way that ensures that the children's growing appreciation of the phonemic structure of the language will yield a confident, productive understanding of the logic of its written representation.

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From Chapter 3: Listening Games

LISTENING TO SEQUENCES OF SOUNDS

Objective

To develop the memory and attentional abilities for thinking about sequences of sounds and the language for discussing them.

Materials needed

Objects that make interesting, distinctive sounds. Some examples follow:

banging on wall/table/lap
blowing
blowing a whistle
blowing nose
clapping
clicking with tongue
closing purse
coloring hard on paper
coughing
crumpling paper
cutting with a knife
cutting with scissors
dropping (various things)
drumming with fingers
eating an apple
folding paper
hammering
hopping
noisy chewing
opening window or drawer
pouring liquid
ringing a bell
rubbing hands together
scratching
sharpening a pencil
slamming a book
smashing crackers
snapping fingers
stamping
stirring with teaspoon
tearing paper
tiptoeing
turning on computer
walking
whistling
writing on board
writing with a pencil

Activity

In this game, the children are challenged first to identify single sounds and then to identify each one of a sequence of sounds. Both will be very important in the language games to come. The children are to cover their eyes with their hands while you make a familiar noise such as closing the door, sneezing, or playing a key on the piano. By listening carefully and without peeking, the children are to try to identify the noise.

Once the children have caught on to the game, make two noises, one after the other. Without peeking, the children are to guess the two sounds in sequence saying, "There were two sounds. First we heard a _____, and then we heard a _____."

After the children have become quite good with pairs of noises, produce series of more than two for them to identify and report in sequence. Again, complete sentences should be encouraged.

Remember that, to give every child the opportunity to participate mentally in these games, it is important to discourage all children from calling out their answers until they are asked to do so. In addition, both to support full participation and to allow assessment of individual students, it is helpful to switch unpredictably between inviting a response from the whole group and from individual children of your designation.

Note: Because of the importance of the skill exercised through this game, invest special care in noting every child's progress and difficulties. Extra opportunities should be created to work with children who are having trouble with the concept of sequences or in expressing their responses.

Variations

- With the children's eyes closed, make a series of sounds. Then repeat the sequence, but omit one of the sounds. The children must identify the sound that has been omitted from the second sequence.
- Invite the children to make sounds for their classmates to guess.
- These games also offer good opportunities to review, exercise, and evaluate children's use of ordinal terms, such as first, second, third, middle, last. It is worth ensuring that every student gains comfortable, receptive, and expressive command of these terms.

From Chapter 3: Listening Games

NONSENSE

Objective

To develop the children's ability to attend to differences between what they expect to hear and what they actually hear.

Materials needed

Book of familiar stories or poems.

Activity

Invite the children to sit down and close their eyes so that they can concentrate on what they will hear. Then recite or read aloud a familiar story or poem to the children but, once in a while, by changing its words or wording, change its sense to nonsense. The children's challenge is to detect such changes whenever they occur. When they do, encourage them to explain what was wrong. As the game is replayed in more subtle variations across the year, it will also serve usefully to sharpen the children's awareness of the phonology, words, syntax, and semantics of language.

As illustrated in the following list, you can change any text in more or less subtle ways at a number of different levels including phonemes, words, grammar, and meaning. Because of this, the game can be profitably and enjoyably revisited again and again throughout the year. Even so, in initial plays of the game, it is important that the changes result in violations of the sense, meaning, and wording of the text that are relatively obvious. Following are some examples of the "nonsense" that can be created within familiar poems and rhymes:

Song a sing of sixpence	Reverse words
Baa baa purple sheep	Substitute words
Twinkle, twinkle little car	Substitute words
Humpty Dumpty wall on a sat	Swap word order
Jack fell down and crown his broke	Swap word order
One, two, shuckle my boo	Swap word parts
I'm a tittle leapot	Swap word parts
The eensy weensy spider went up the spouter wat.	Swap word parts
One, two, buckle my shoe	
Five, six, pick up sticks	Switch order of events
Little Miss Muffet, eating a tuffet Sat on her curds and whey	Switch order of events
Goldilocks went inside and knocked on the door.	Switch order of events
The first little piggy built himself a house of bricks.	Switch order of events

Note: Don't forget to switch unpredictably between asking the whole group or individual children to respond.

From Chapter 6: Awareness of Syllables

CLAPPING NAMES

Objective

To introduce the children to the nature of syllables by leading them to clap and count the syllables in their own names.

Activity

When you first introduce this activity, model it by using several names of contrasting lengths. Pronounce the first name of one of the children in the classroom syllable by syllable while clapping it out before inviting the children to say and clap the name along with you. After each name has been clapped, ask "How many syllables did you hear?" Once the children have caught on, ask each child to clap and count the syllables in his or her own name. Don't forget last names, too! It is easy to continue clapping other words and to count the syllables in each. When doing the activity for the first time, model each child's name by pronouncing it, clapping it, and then having all of the children clap it together. After each name has been clapped by all of the children, ask "How many syllables did you hear?" If a name has many syllables, you may need to let children count the syllables as they are clapping.

Variations

- Ask the children to clap and count the syllables of their first and last names together.
- After determining the number of syllables in a name, ask the children to hold two fingers horizontally under their chins, so they can feel the chin drop for each syllable. To maximize this effect, encourage the children to elongate or stretch each syllable.
- As follows, this activity can be done to a rhythmic chant, such as "Bippity, Bippity Bumble Bee":

  Bippity, bippity bumble bee, Tell me what your name should be.

  (Point to a child; that child responds by giving his name. Class repeats name out loud. Continue with one of the following:)

  1. "Clap it!" (Children repeat name, enunciating and clapping to each syllable.)
  2. "Whisper it!" (Children whisper each syllable while clapping.)
  3. "Silent!" (Children repeat name, silently enunciating syllables with mouth movement.)

From Chapter 7: Initial and Final Sounds

FINDING THINGS: INITIAL PHONEMES

Objective

To extend the children's awareness of initial phonemes by asking them to compare, contrast, and eventually identify the initial sounds of a variety of words.

Materials needed

Picture cards

Activity

This game should be played as an extension of Activity 7B: Different Words, Same Initial Phoneme. Spread a few pictures out in the middle of the circle. Then ask the children to find those pictures whose names start with the initial sound on which they have just been working. As each picture is found, the child is to say its name and initial phoneme as before (e.g., *f-f-f-ish, /f-f-f/, fish*).

Variations

- As the children become more comfortable with the game, spread out pictures from two different sets, asking the children to identify the name and initial phoneme of each picture and to sort them into two piles accordingly.
- Pass pictures out to the children; each must identify the initial phoneme of her or his picture and put it in the corresponding pile. This game works well with small groups.
- Sound-tration: Pass pictures of objects or animals to the children, naming each picture and placing it face down on the table or carpet. Children take turns flipping pairs of pictures right side up and deciding if the initial sounds of the pictures' names are the same. If the initial sounds match, the child selects another pair; otherwise, another child takes a turn. This game works well with small groups.

From Chapter 7: Initial and Final Sounds

WORD PAIRS I: TAKE A SOUND AWAY (ANALYSIS)

Objective

To help the children to separate the sounds of words from their meanings.

Activity

By showing the children that if the initial phoneme of a word is removed a totally different word may result, this activity further helps children to separate the sounds of words from their meanings. With the children seated in a circle, explain that sometimes when you take a sound away from a word, you end up with a totally different word. To give the children an example, say *"f-f-f-ear,"* elongating the initial consonant, and have the children repeat. Then say "*ear,*" and have the children repeat. Ask the children if they can determine which sound has been taken away and repeat the words for them (i.e., *f-f-f-f-ear...ear...f-f-f-f...ear...ear*).

In this way, the children are challenged to attend to the initial phonemes of words even as they come to realize that the presence or absence of the initial phoneme results in two different words. Across days, gradually work up from the easier initial consonants to harder ones. Sample word lists are provided at the end of the chapter.

Note: Most children can identify the "hidden word" but have a great deal of difficulty in identifying what is taken away. Children may also be inclined to produce rhyming words rather than to focus on initial sounds. With this in mind, take care not to flip back and forth between the activities involving rhyming and initial sounds.

Variations

- To help the children notice that the initial sound makes a big difference in the words' meanings, ask them to use each word in a sentence.
- When the children are comfortable with this game, play it with game 7I: Spider's Web.
- Call the children to line up by naming their first names without the initial sound (e.g., *[J]-onathon*). The children have to figure out whose name has been called and what sound is missing. You may want to delete initial blends as a unit until after blends have been introduced in Chapter 8 (e.g., *[St]-anley*).

From Chapter 7: Initial and Final Sounds

WORD PAIRS II: ADD A SOUND (SYNTHESIS)

Objective

To introduce the children to the challenge of synthesizing words from their separate phonemes.

Activity

Seat the children in a circle, and begin by explaining that sometimes a new word can be made by adding a sound to a word. As an example, say *"ox,"* and have the children repeat it. Then ask what will happen if they add a new sound to the beginning of the word such as f-f-f-f-f: *"f-f-f-f-f...ox, f-f-f-f...ox, f-f-f-f-ox."* The children say "*fox!*" You should then explain, "We put a new sound on the beginning, and we have a new word!"

Until the children catch on, you should provide solid guidance, asking the children to say the word parts with you in unison (e.g., "ice...m-m-m-m...ice...m-m-m-ice...mice"). Again, it is appropriate to work up gradually, across days, from the easier initial consonants to harder ones and, only after the latter are reasonably well established, to consonant blends (e.g., *mile-smile*).

Variations

- Invite the children to use each word of a pair in a sentence to emphasize the difference in their meanings.
- When the children are good at this, play it with 7I: Spider's Web.

From Chapter 8: Phonemes

TWO-SOUND WORDS

Objective

To introduce the children to the challenges of analyzing words into phonemes and of synthesizing words from phonemes.

Materials needed

Blocks
Two-phoneme word cards

Activity

The two-sound games serve to introduce the procedure and logic of the more difficult phonemic analysis and synthesis activities that follow. In addition, two-sound words provide an unfettered medium for giving children practice with the sounds of the various phonemes, both in isolation and as blended together in phonologically minimal words. In view of this, it is more helpful to revisit them as needed by individuals or by the group than to dwell too long in any given session. Because of their foundational importance, however, it is critical that every child grasp this concept before moving on to the more advanced activities.

On the first day, it is sufficient to do analysis only. On subsequent days, begin with analysis and shift to synthesis. Similarly, for the first few days, it is wise to separate play with initial consonant words from play with final consonant words for clarity. Once the children have caught on, the two types of words should be freely intermixed. Finally, because the short vowels are so much more variable and less distinctive in both sound and articulation, their introduction should be deferred until the children are reasonably comfortable with long-vowel words. Again, to clarify the children's image of the phonemes and to support their ability to distinguish them one from another, it is valuable to ask them to feel how their mouths change position with each sound or to look at their mouths in a mirror while saying the words. In addition, as in all of the phonemic awareness activities, it is important to ensure that the students are familiar with each word used in these exercises. If you suspect that any of your students are not, it is wise to review the word's meaning and usage.

Note: To play these games, each of the children should have two blocks. In addition, you should have two blocks of your own and a set of pictures of two-phoneme words. Also, before beginning, it is important to have read the introduction to this chapter.

Analysis

A child picks a card and names what it depicts. For this example, let us assume that the child chooses a picture of a hair bow. You would repeat the word, but slowly and with a clear pause (about a half-second interval) between its two phonemes (e.g., "*b...ō*"). Then all of the children should repeat the word in this same manner, "*b...ō...*" To show that the word *bow* consists of two separate sounds, the teacher now places blocks in two different colors underneath the picture as she enunciates the sound represented by each.

The children then repeat the word sound by sound while representing the sounds of the word, left to right, with their own blocks. The children should repeat the sounds while pointing to the respective blocks and then the word, pausing slightly less between phonemes with each repetition. (e.g., "*b....ō.., bow, b...ō.bow, b..ō, bow, b-ō..bow*").

Synthesis

This game is just the reverse of the analysis game and likewise requires that you model the procedure before turning it over to the children. Choose a picture and place it face down so the children cannot see it. Then name the picture, phoneme by phoneme (e.g., "*b...ō*"), while placing the blocks beneath the picture. While pointing to their own blocks, the children must repeat the phonemes over and over and faster and faster as they did in the analysis game. When they believe they know the identity of the picture, they should raise their hands. The teacher may then ask the

group or any individual to name the picture. After resolving any disagreements, the picture is held up for all to see.

After modeling several words in this way, pass the challenge to the children. For each new picture, help them agree on its name and give them time to analyze it on their own. To gain a good sense of who is and is not catching on, ask one or more individuals to share his or her solution to each word. Then the whole group should repeat the solution together, voicing the separate phonemes of the word as they point to their corresponding blocks.

Variations

- Extend the exercise to unpictured words. At the outset of each analysis challenge, be sure to use each word in a sentence for the sake of clarity (e.g., "Chew. Please *chew* your food before you swallow it. Chew."). Similarly, ask the children to use each word in a sentence as part of the wrap-up of each synthesis challenge.
- Later, this game can be used to teach the alphabetic principle by replacing the colored blocks with letter tokens. If you choose to do so, however, bear in mind that to convey the essential logic of the alphabetic principle, it is best that all words include one letter for each sound, left to right. With this in mind, avoid words with silent letters or digraphs. Use only short vowel words and, among those, only those that are spelled with two letters (e.g., *in* and *am* are fine, but not *edge* or *itch*).

Note: All of the words in the following lists consist of only two phonemes. Nevertheless, due to the vagaries of English, the spellings of many involve more than two letters. For this reason, showing the words' spellings will only confuse the issue for now. The following are examples of two-sound words with initial consonants and long vowels:

day	bee	bye	bow	boo
hay	fee	die	doe	chew
jay	gee	guy	go	coo
may	he	hi	hoe	do
pay	knee	lie	low	goo
ray	me	my	mow	moo
say	pea	pie	no	shoe
way	see	rye	row /rō/	two
	she	sigh	sew /sō/	who
	tea	tie	show	you
	we	why	toe	zoo

The following are examples of two-sound words with final consonant sounds and long vowels:

ace	each
ache	ease
age	eat
aid	eel
ail	ice
aim	oak
ape	oat
eight	own

The following are examples of two-sound words with final consonant sounds and short vowels:

add	Ed	itch
am	ick	odd
an	if	off
as	ill	on
ash	in	up
at	is	us
edge	it	

From Chapter 8: Phonemes

TROLL TALK II: PHONEMES

Objective

To reinforce students' ability to synthesize words from their separate phonemes.

Activity

This activity is analogous to that presented in 6E: Troll Talk I: Syllables, except that the troll describes his treats phoneme by phoneme instead of syllable by syllable. Everyone sits in a circle, and the teacher tells a tale:

> Once upon a time, there was a kind, little troll who loved to give people presents. The only catch was that the troll always wanted people to know what their present was before giving it to them. The problem was that the little troll had a very strange way of talking. If he was going to tell a child that the present was a *bike,* he would say *"b...i...k."* Not until the child has guessed what the present was would he be completely happy. Now I will pretend to be the troll. I will name a surprise for one of you. When you figure out what it is, it will be your turn.

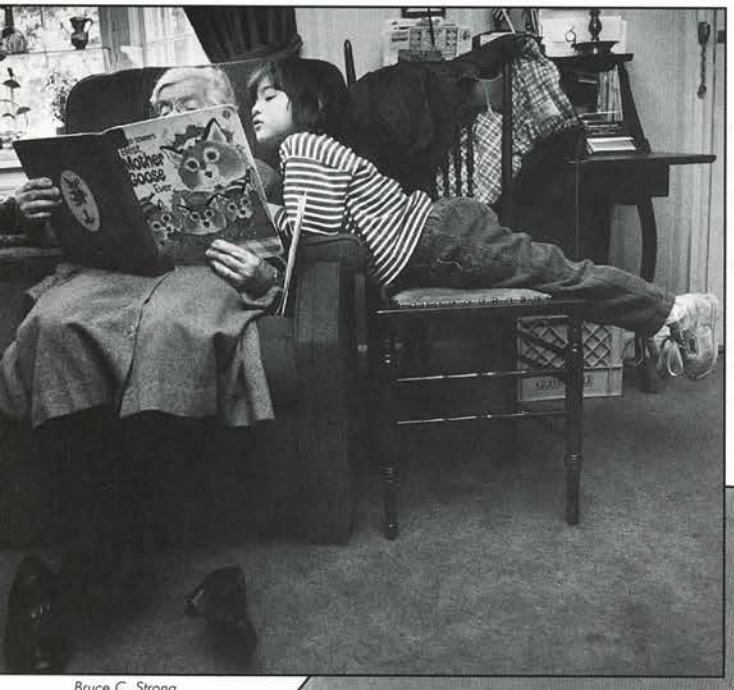
Choose one child and pronounce the name of a present, phoneme by phoneme. When the child guesses the word, she or he is to name a present for somebody else. Work up from short (two- and three-sound) words to longer ones as children become more adept at hearing the sounds. It is best to limit the game to only four or five children on any given day or it becomes a bit long. Examples of gifts include the following:

ape	cheese	moose	soap
bean	desk	pan	stool
book	dog	pea	stump
bow	dress	pen	tie
bread	eel	phone	train
brick	glass	shoe	truck
broom	ice	skate	

Note: If the students are not familiar with trolls, then substitute another person or creature from folklore such as a leprechaun, unicorn, or elf.

Variation

- Each child gets from one to three "secret" pictures. They may now give the things in the pictures as "presents," one thing at a time, to another child by sounding out the word. The child who receives the present has to guess what it is before she or he can have the picture.



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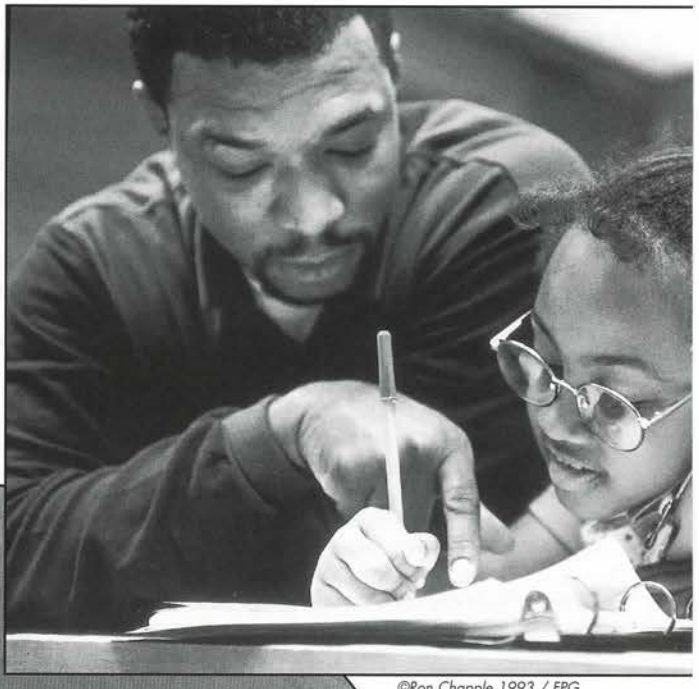

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Abraham Lincoln with his son Tad: Corbis-Bettmann

Photo by Connie Thompson: Courtesy of the Center for the Book in the Library of Congress

CATCH THEM BEFORE THEY FALL

Identification and Assessment To Prevent Reading Failure in Young Children

BY JOSEPH K. TORGESEN

ONE OF the most compelling findings from recent reading research is that children who get off to a poor start in reading rarely catch up. As several studies have now documented, the poor first-grade reader almost invariably continues to be a poor reader (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Torgesen & Burgess, 1998). And the consequences of a slow start in reading become monumental as they accumulate exponentially over time. As Stanovich (1986) pointed out in his well-known paper on the "Matthew effects" (the rich get richer and the poor get poorer) associated with failure to acquire early word reading skills, these consequences range from negative attitudes toward reading (Oka & Paris, 1986), to reduced opportunities for vocabulary growth (Nagy, Herman, & Anderson, 1985), to missed opportunities for development of reading comprehension strategies (Brown, Palinscar, & Purcell, 1986), to less actual practice in reading than other children receive (Arlington, 1984).

The best solution to the problem of reading failure is to allocate resources for early identification and prevention. It is a tragedy of the first order that while we know clearly the costs of waiting too long, few school districts have in place a mechanism to identify and help children before failure takes hold. Indeed, in the majority of cases, there is no systematic identification until third grade, by which time successful remediation is more difficult and more costly.

School-based preventive efforts should be engineered to maintain growth in critical word reading skills at *roughly normal* levels throughout the early elementary school period. Although adequate development of these skills in first grade does not guarantee that children will continue to maintain normal growth in second grade without extra help, to the extent that we allow children to fall seriously behind at any point during early elementary school, we are moving to a "remedial" rather than a "preventive" model of intervention. Once children fall behind in the growth of critical word reading skills, it may require very intensive interventions to bring them back up to adequate levels of reading accuracy (Allington & McGill-Franzen, 1994; Vaughn & Schumm, 1996), and reading fluency may be even more difficult to restore because of the large amounts of reading practice that is lost by children each month and year that they remain poor readers (Rashotte, Torgesen, & Wagner, 1997).

The purpose of this article is to provide practical advice about methods to prevent reading failure that is grounded in the new knowledge about reading we have acquired over the past two decades. My primary focus will be on early identification of children at risk for problems in learning to read as well as methods for monitoring the growth of critical early reading skills. The goal is to describe procedures that will allow educators to *identify children who need extra help in reading before they experience serious failure* and to monitor the early development of reading skill to *identify children who may require extra help as reading instruction proceeds* through elementary school.

The advice provided in this article is based on the research my colleagues Richard Wagner, Carol Rashotte, and I have been conducting on both prediction and prevention of reading disabilities (Torgesen, Wagner, & Rashotte, 1994; 1997; Wagner, et al., 1994; 1997) as well as the work of many other researchers that was reviewed in an earlier issue of this magazine (Summer, 1995). It is guided by several important assumptions and facts about reading, reading growth, and reading failure that will be discussed first. Following this description of assumptions and a brief outline of some critical dimensions of preventive instruction, I will describe a number of specific measures and procedures that should prove useful as educators seek

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Joseph K. Torgesen is currently a Distinguished Research Professor of psychology and education at Florida State University. For the last ten years, he has been part of the research effort sponsored by the National Institutes of Health to identify the nature, causes, and best approaches to instruction for children with moderate to severe reading problems. *The research conducted at Florida State University that is cited in this article was supported by grants numbered HD23340 and HD30988 from the National Institute of Child Health and Human Development, and by grants from the National Center for Learning Disabilities and the Donald D. Hammill Foundation.*

ways to focus more intensive instruction on children whose needs are greatest.

Assumptions about reading, reading growth, and reading failure

Most of the points that will be discussed in this section are not, in fact, mere assumptions about reading, but, rather, are well-established facts. However, I use the word assumption here to convey the sense either that the ideas are self-evident or that they are now assumed to be true based on consistent research findings. The first of these "assumptions" is, in fact, a self-evident value judgment.

Adequate reading comprehension is the most important ultimate outcome of effective instruction in reading. The ultimate purpose of reading instruction is to help children acquire the skills that enable learning from, understanding, and enjoyment of written language. This "assumption" is not controversial. No matter what one's personal preferences for instructional method, the end goal is to help children comprehend written material at a level that is consistent with their general intellectual abilities.

Two general types of skill and knowledge are required for good reading comprehension. Consistent with Gough's "simple view of reading" (1996), comprehension of written material requires: 1) general language comprehension ability; and 2) ability to accurately and fluently identify the words in print. Knowledge and active application of specific reading strategies is also required to maximize reading comprehension (Mastropieri & Scruggs, 1997) but most of the variability among children and adults in comprehension of written material can be accounted for by measuring the two broad families of skills identified in Gough's simple view (Hoover & Gough, 1990). That is, good general language comprehension and good word reading skills are the most critical skills required for effective comprehension of written material.

Most children who become poor readers experience early and continuing difficulties in learning how to accurately identify printed words. This difficulty is expressed most directly on two kinds of reading tasks. First, children destined to be poor readers at the end of elementary school almost invariably have difficulties understanding and applying the alphabetic principle in deciphering unfamiliar words. These children have unusual difficulties learning to use the regular patterns of correspondence between letters and sounds in words as an aid in identifying new words they encounter in text (Siegel, 1989). They have trouble "sounding out" unknown words. Second, poor readers at all grade levels are characterized by slower than normal development of a "sight vocabulary" of words they can read fluently and automatically. Ultimately, it is this difficulty in rapid word recognition that limits comprehension in older poor readers, for these skills allow children to focus on constructing the meaning of what they are reading rather than spending too many of their intellectual resources on trying to identify the words (Adams, 1990). The strongest current theories of reading growth link phonetic and "sight word" reading skills together by showing how good phonetic reading skills are necessary in the formation of accurate memory for the spelling patterns that are the basis of sight word recognition (Ehri, in press; Share & Stanovich, 1995).

The most common cause of difficulties acquiring early word reading skills is weakness in the ability to process the phonological features of language (Liberman, Shankweiler, & Liberman, 1989). This is perhaps the most important discovery about reading difficulties in the last twenty years. Weaknesses in the phonological area of language development can be measured by a variety of nonreading tasks, but the ones most commonly used assess phonemic awareness, which can be defined simply as the ability to identify, think about, or manipulate the individual sounds in words. Much of our new confidence in being able to identify children at risk for reading failure before reading instruction begins depends on the use of tests of phonemic awareness, since this ability has been shown to be causally related to the growth of early word reading skills (Lundberg, Frost, & Peterson, 1988; Wagner, et al., 1997).

Discovery of the core phonological problems associ-

ated with specific reading disability has had at least one unanticipated consequence. The ability to assess these core language problems directly has led to the discovery that the early word reading difficulties of children with relatively low general intelligence and verbal ability are associated with the same factors (weaknesses in phonological processing) that interfere with early reading growth in children who have general intelligence in the normal range (Fletcher, et al., 1994; Share & Stanovich, 1995; Stanovich & Siegel, 1994). So, weaknesses in phonemic awareness characterize children with reading problems across a broad span of general verbal ability. On the one hand, many children enter school with *adequate general verbal ability* and cognitive weaknesses limited to the phonological/language domain. Their primary problem in learning to read involves learning to translate between printed and oral language. On the other hand, another significant group of poor readers, composed largely of children from families of lower socio-economic or minority status, enter school significantly delayed in a much broader range of prereading skills (Whitehurst & Lonigan, in press). Since these children are delayed not only in phonological but also in general oral language skills, they are deficient in both of the critical kinds of knowledge and skill required for good reading comprehension. Even if these children can acquire adequate word reading skill, their ability to comprehend the meaning of what they read may be limited by their weak general verbal abilities.

Children with general oral language weaknesses require extra instruction in a broader range of knowledge and skills than those who come to school impaired only in phonological ability. What is well established at this point, though, is that *both kinds of children* will require special support in the growth of early word reading skills if they are to make adequate progress in learning to read.

Elements of an effective preventive program in reading

The most critical elements of an effective program for the prevention of reading disability at the elementary school level are: (a) the right kind and quality of instruction delivered with the (b) right level of intensity and duration to (c) the right children at the (d) right time. I will briefly consider each of these elements in turn.

The right kind and quality of instruction. It is beyond the scope of this article to discuss instructional methods for children with phonological processing weaknesses in any depth at all. In broad stroke, they will benefit from the same approach to reading instruction as children with normal abilities in this area—structured, systematic, and explicit—but for this at-risk group, such instruction is not just beneficial, it is critical. As experienced teachers understand (Gaskins, et al., 1996), we cannot assume that these children will acquire any necessary skill for reading words unless they are directly taught that skill or knowledge and receive sufficient opportunities to practice it. Some of the word-level skills and knowledge these children will require instruction on include: phonemic awareness, letter-sound correspondences, blending skills, a small number of pronunciation conventions (i.e., silent *e* rule), use of context to help specify a word once it is partially or completely phonemically decoded, strategies for multi-syllable words, and automatic recognition of high-frequency "irregular" words. It goes almost without saying that this type of instruction should be embedded within as many opportunities for meaningful reading and writing as possible.

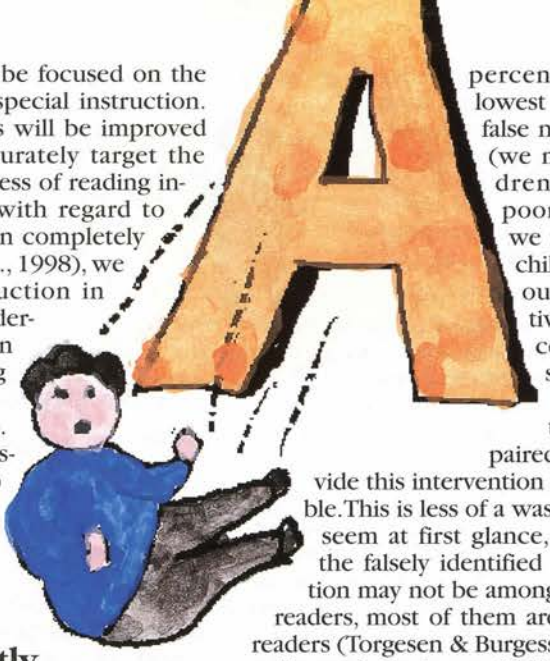
The lesson from recent large-scale prevention studies (Brown & Felton, 1990; Foorman, et al., 1998; Torgesen, et al., 1998; Vellutino, et al., 1997) is that it is possible to maintain critical word reading skills of most children at risk for reading failure at roughly average levels if this type of instruction is provided beginning sometime during kindergarten or first grade. However, it is also true that in all studies conducted to date, substantial proportions of children with the most severe weaknesses remain significantly impaired in these critical skills following intervention. For example, if we adopt the 30th percentile as a standard for adequate reading progress, then the proportion of the total population remaining at risk in spite of the best interventions tested to date ranges from 5 percent to 7 percent (Torgesen, 1998). Although these results are clearly better than the 30 percent to 60 percent of children who frequently fall below these standards without special interventions, they nevertheless suggest that there is a core of disabled readers in the population for whom we have not yet solved the reading puzzle.

It is almost certain that some additional answers to this question will come as we direct our attention to the quality and intensity, as well as the content, of our instruction. For example, Juel (1996) has shown the importance of a particular kind of "scaffolded" interaction between teacher and child in increasing understanding and application of phonemic reading skills, and these types of interactions are also prescribed in the teacher manuals of at least two widely used instructional programs designed for children with reading disabilities (Lindamood & Lindamood, 1984; Wilson, 1988). We turn now to a brief consideration of issues surrounding intensity of instruction.

The right level of intensity. Greater intensity and duration of instruction is required because the increased explicitness of instruction for children who are at risk for reading failure requires that more things be taught directly by the teacher. Intensity of instruction is increased primarily by reducing teacher/student ratios. Unless beginning reading instruction for children with phonological weaknesses is more intensive (or lasts significantly longer) than normal instruction, these children will necessarily lag significantly behind their peers in reading growth. An effective preventive program may involve several levels of instructional intensity ranging from small-group to one-on-one instruction, depending upon the severity of the risk factors for each child.

The right children at the right time. These factors are considered together because they are both tied directly to the availability of accurate identification procedures at various age levels. That is, to be most effi-

cient, a preventive program should be focused on the children who are most in need of special instruction. The efficiency of the entire process will be improved if procedures are available to accurately target the right children very early in the process of reading instruction. Although timing issues with regard to preventive instruction have not been completely resolved by research (Torgesen, et al., 1998), we do know, for example, that instruction in phonological awareness during kindergarten can have a positive effect on reading growth after formal reading instruction begins in the first grade (Lundberg, Frost, & Peterson, 1988). Thus, I have proceeded on the assumption that it will be useful to identify high-risk children at some time during the kindergarten year so that preventive work may begin as early as possible.



How accurate are currently available early identification procedures?

As stated earlier, the primary purpose of this article is to make some practical suggestions about procedures and tests that can be used to identify children for preventive reading or prereading instruction. From the outset, however, it is important to recognize that our ability to predict which children will have the most serious reading difficulties is still far from perfect. For example, in a recent comprehensive review of early identification research (1998), Scarborough pointed out that all studies continue to report substantial levels of two kinds of prediction errors.

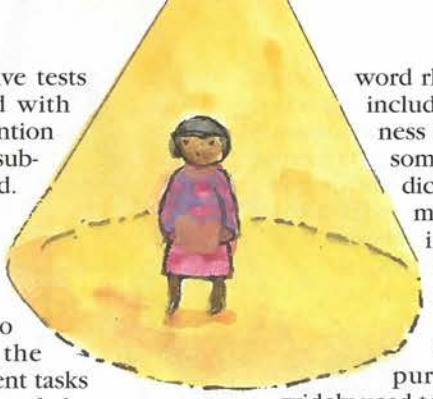
False positive errors are made when children who will eventually become good readers score below the cut-off score on the predictive instrument and are falsely identified as "at risk." In general, the proportion of this type of error has ranged between 20 percent and 60 percent, with an average of around 45 percent. That is, almost half of the children identified during kindergarten as "at risk" turn out not to have serious reading problems by the end of first grade. *False negative* errors occur when children who later exhibit reading problems are identified as not being at risk. Typical percentages of false negative errors range from 10 percent to 50 percent, with an average of around 22 percent. That is, on average, current procedures fail to identify about 22 percent of children who eventually end up with serious reading difficulties.

In any given study, the relative proportion of false positive and false negative errors is somewhat arbitrary, since it depends on the level of the cut-off score. For example, we reported a significant reduction in the percentage of false negative errors within the same sample of children by doubling the number of children we identified as at risk (Torgesen, in press; Torgesen & Burgess, 1998). Our goal was to identify, during the first semester of kindergarten, the children most at risk to be in the bottom 10 percent in word reading ability by the beginning of second grade. When we selected the 10 percent of children who scored lowest on our predictive tests, our false negative rate was 42 percent (we missed almost half the children who became extremely poor readers). However, when we identified the 20 percent of children who scored lowest on our measures, the false negative rate was reduced to 8 percent. As a practical matter, if schools desire to maximize their chances for early intervention with the most impaired children, they should provide this intervention to as many children as possible. This is less of a waste of resources than it might seem at first glance, because, although many of the falsely identified children receiving intervention may not be among the most seriously disabled readers, most of them are likely to be below-average readers (Torgesen & Burgess, 1998).

Two other pieces of information are relevant to the selection of procedures for early identification of children at risk for reading difficulties. First, prediction accuracy increases significantly the longer a child has been in school. Prediction of reading disabilities from tests given at the beginning of first grade is significantly more accurate than from tests administered during the first semester of kindergarten (Scarborough, 1998; Torgesen, Burgess, & Rashotte, 1996). Given the widely varying range of children's preschool learning opportunities, many children may score low on early identification instruments in the first semester of kindergarten simply because they have not had the opportunity to learn the skills. However, if prereading skills are actively taught in kindergarten, some of these differences may be reduced by the beginning of the second semester of school. Thus, I would recommend that the screening procedures described here not be administered until the beginning of the second semester of kindergarten, at which time they will be much more efficient in identifying children who will require more intensive preventive instruction in phonemic awareness and other early reading skills.

Second, although batteries containing multiple tests generally provide better prediction than single instruments, the increase in efficiency of multi-test batteries is generally not large enough to warrant the extra time and resources required to administer them (Scarborough, 1998). Thus, I recommend an identification procedure involving administration of two tests: 1) a test of knowledge of letter names or sounds; and 2) a measure of phonemic awareness. Measures of letter knowledge continue to be the best single predictor of reading difficulties, and measures of phonemic awareness contribute additional predictive accuracy. In our experience, tests of letter name knowledge are most predictive for kindergarten children, and tests of letter-sound knowledge are most predictive for first graders. Since reading growth is influenced by noncognitive factors such as attention/motivation and home background (Torgesen, et al., 1998), as well as specific knowledge

and skills, scores from these objective tests might profitably be supplemented with teacher ratings of behavior and attention to identify children most at risk for subsequent difficulties in learning to read.



How should phonemic awareness be assessed?

Since researchers first began to study phonological awareness in the early 1970s, more than twenty different tasks have been used to measure awareness of phonemes in words. These measures can be grouped into three broad categories: sound comparison, phoneme segmentation, and phoneme blending.

■ *Sound comparison* tasks use a number of different formats that all require children to make comparisons between the sounds in different words. For example, a child might be asked to indicate which word (of several) begins or ends with the same sound as a target word (i.e., "Which word begins with the same first sound as *cat: boy, cake,* or *fan*?"). Additionally, tasks that require children to generate words that have the same first or last sound as a target word would fall in this category. Sound comparison tasks are among the least difficult measures of phonemic awareness, and thus are particularly appropriate for kindergarten age children.

■ *Phoneme segmentation* tasks involve counting, pronouncing, deleting, adding, or reversing the individual phonemes in words. Common examples of this type of task require pronouncing the individual phonemes in words ("Say the sounds in *cat* one at a time."), deleting sounds from words ("Say *card* without saying the /d/ sound."), or counting sounds ("Put one marker on the line for each sound you hear in the word *fast.*")

■ *Phoneme blending* skill has only been measured by one kind of task. This is the sound-blending task in which the tester pronounces a series of phonemes in isolation and asks the child to blend them together to form a word (i.e., "What word do these sounds make, /f/ - /a/ - /t/?"). Easier variants of the sound-blending task can be produced by allowing the child to choose from two or three pictures the word that is represented by a series of phonemes.

In general, these different kinds of phonemic awareness tasks all appear to be measuring essentially the same construct, or ability. Although some research (Yopp, 1988) has indicated that the tasks may involve different levels of intellectual complexity, and there may be some differences between segmentation and blending tasks at certain ages (Wagner, Torgesen, & Rashotte, 1994), for the most part, they all seem to be measuring growth in the same general ability (Hoien, et al., 1995; Stanovich, Cunningham, & Cramer, 1984). Sound comparison measures are easiest and are sensitive to emergent levels of phonological awareness, while segmentation and blending measures are sensitive to differences among children during later stages of development involving refinements in explicit levels of awareness. Measures of sensitivity to rhyme ("Which word rhymes with *cat: leg* or *mat*?") are not included as measures of phonemic awareness because they appear to be measuring something a little different, and less predictive of reading disabilities, from those measure that ask children to attend to individual phonemes. For the same reason, measures of syllable awareness are not included in this group.

Measures of phonemic awareness that are suited for early identification purposes include the following three widely used tests:

The Phonological Awareness Test (Robertson & Salter, 1995). This test contains five different measures of phonemic awareness, plus a measure of sensitivity to rhyme. The five measures of phonemic awareness are segmentation of phonemes, phoneme isolation, phoneme deletion, phoneme substitution, and phoneme blending. The phoneme isolation test, which requires children to pronounce the first, last, or middle sounds in words, would appear to have the most appropriate level of difficulty for kindergarten screening (the test should be easy enough so that only the most delayed children will do poorly on it), and any of the others could be used for first- or second-grade assessments. *The Phonological Awareness Test* is nationally normed on children from age five through nine, and it can be ordered from LinguiSystems, 3100 4th Avenue, East Moline, IL 61244-0747. Phone: 800-776-4332. The cost of a test manual, test supplies, and fifteen test booklets is $69.

The Test of Phonological Awareness (Torgesen & Bryant, 1994). This test was designed as a group-administered test of phonemic awareness for kindergarten and first-grade children. It was specifically constructed to be most sensitive to children with weaknesses in development in this area, which helps make it appropriate for identifying at-risk children. The kindergarten version of the test requires children to notice which words (represented by pictures) begin with the same first sound, while the first-grade version asks them to compare words on the basis of their last sounds. It can be easily administered to groups of five to ten children at a time. *The Test of Phonological Awareness* is nationally normed, and it can be ordered from PRO-ED Publishing Company, 8700 Shoal Creek Blvd., Austin, TX 78757-6897. Phone: (512) 451-3246. The cost of a test manual and a supply of fifty test forms (twenty-five kindergarten version, twenty-five elementary school version) is $124.

The *Yopp-Singer Test of Phoneme Segmentation* (Yopp, 1995) is a brief test of children's ability to isolate and pronounce the individual phonemes in words. This is a task that has been widely used in research on phoneme awareness over the past twenty years, and it is highly correlated with other measures of phoneme awareness. The test was designed for children in kindergarten, but it should also be appropriate for identifying children who are weak in phonemic awareness during first grade. The test has twenty-two items that are all of the same type and that ask the child to pronounce each of the phonemes in words that vary from two to three phonemes in length. The test does

not have norms with it, but it is available free in volume 49 (1995) of the widely read journal *The Reading Teacher,* pp. 20-29.

The measurement of letter knowledge

In all of our research, we have measured letter knowledge in two ways. We measure *letter name* knowledge by presenting each letter in simple upper-case type on a single card and asking for its name. The score on this test is simply the number of letters for which the child can give the appropriate name. We measure *letter-sound* knowledge by presenting all letters in lower-case type and asking for the "sound the letter makes in words." If a consonant letter can commonly represent two different sounds (i.e., c, g) we probe for the second sound, and we also ask for the long and short pronunciation of each vowel. The score is the total number of sounds the child can give. We have found that letter-name knowledge is a more sensitive predictor for kindergarten children, while letter-sound knowledge is a better predictor for children in first grade. Two tests that provide nationally standardized norms for performance on letter-name and letter-sound knowledge are:

The *letter identification* subtest of the *Woodcock Reading Mastery Test-Revised* (Woodcock, 1987). This test does not measure simple letter-name knowledge in the way we assess it, because it presents letters in several different fonts, some of which may be unfamiliar to children. It also allows children to give either the name or the sound the letter makes in words. However, children who perform poorly in kindergarten (do not know the names of very many letters) will not reach the more difficult items, so that their score should be quite comparable to a more straightforward test of letter-name knowledge. *The Reading Mastery Test-Revised* is available from American Guidance Service, 4201 Woodland Road, Circle Pines, MN 55014-1796. Phone (800) 328-2560. The cost for the manual and forms is $314.95.

The *graphemes* subtest of the *Phonological Awareness Test* (Robertson & Salter, 1995). This test provides a comprehensive assessment of letter-sound knowledge extending from single consonants (i.e., b,c,k,m) through vowel digraphs and diphthongs (i.e., ea, ai, ow, oy). As mentioned before, it is standardized on children from aged five through nine.

Is it necessary for a test to be nationally standardized for it to be useful in early identification?

This issue is important because of the potential expense of employing standardized measures in large-scale screening efforts. Nationally based norms are *not* required to identify which children within a given classroom or school are weakest in phonemic awareness and letter knowledge. However, the proportion of children who come to school with weak skills and knowledge in these areas will depend somewhat on specific aspects of their preschool language and literacy environment and will almost certainly vary from school to school across different communities. Tests with national norms can help to pinpoint classes or schools in which a special effort must be made to enhance phonological awareness in children prior to, or during, reading instruction. For example, a classroom in which 75 percent of the children performed below the 20th percentile (in the bottom 20 percent of all children), will require more instructional resources to prepare children for learning to read than a classroom in which only 10 percent of the children scored that low. Without norms, it is possible to identify weak children within a given class or school, but it is not possible to determine what proportion of children in the entire school may require intervention because of relatively weak prereading skills and knowledge. On the one hand, if classroom resources allow extra help for only a fixed number of children (say, 20 percent to 30 percent), then measures without national norms can be used to identify the group of children within the classroom most in need of intervention. On the other hand, if the goal is to determine the amount of resources that may be needed to help all children with relatively weak skills in these areas, then normative measures will be required.

The combination of letter knowledge and phonemic awareness tests I have recommended should take no more than ten to fifteen minutes per child to administer. The tests do not require highly trained personnel to administer them, although anyone who tests young children must be very familiar with the tests and be able to establish a supportive rapport.

Monitoring growth in early reading skills

Once reading instruction begins, the best predictor of future reading growth is current reading achievement, and the most critical indicators of good progress in learning to read during the early elementary period are measures of word reading skill. Children who end up as poor readers at the end of elementary school are almost invariably those who fail to make normal progress in these skills during the first years of elementary school. These children are most frequently impaired in both the ability to apply phonetic strategies in reading new words and in the ability to retrieve sight words from memory. They not only have difficulty becoming accurate in the application of these processes but also they frequently have special difficulties with becoming fluent in their application. Before discussing specific methods for the diagnostic assessment of these word reading skills, one general issue regarding reading assessment requires discussion.

First, the assessment that will be recommended here is very different from the "authentic literacy assessment" that is currently advocated by many reading professionals (Paris, et al., 1992). Authentic assessment is different in at least two ways from the reading assessment measures we will be discussing. First, the goal of "authentic assessment" is to measure children's application of broad literacy skills to authentic tasks, like gathering information for a report, use of literacy as a medium for social interactions, or ability to read a selec-

tion and then write a response to it. It also seeks to measure children's enjoyment, ownership, and involvement in literacy activities both at school and at home.

This kind of assessment is a clear complement to the type of assessments we will describe for monitoring growth in word level reading skills. All of the literacy outcomes that are part of authentic assessment are important parts of a total literacy assessment program. After all, if a child can read, but does not enjoy reading and does not apply important literacy skills to everyday tasks, then some important goals of literacy instruction have not been attained.

However, since these procedures are focused on high-level reading outcomes, they cannot provide precise information about level of performance on important subskills in reading. If a child's overall performance on authentic literacy tasks is limited, it is frequently difficult to obtain a precise estimate of the specific component skills that are weak. The goal of the kind of assessments we will discuss here is to quantify the degree of skill a child possesses in word identification processes that have been shown to be a critical foundation for overall reading success.

Commonly used diagnostic measures of word reading ability

It is beyond the scope of this article to identify all the available tests of word level reading skills. Rather, I will provide examples of measurement strategies from the most commonly used measures.

Sight word reading ability. Two measures are widely used in this area, and both involve the same assessment strategy. The Word Identification subtest from the *Woodcock Reading Mastery Test-Revised* (Woodcock, 1987), and the reading subtest of the *Wide Range Achievement Test-3* (Wilkinson, 1995) both require children to read lists of words that gradually increase in length and complexity while decreasing in frequency of occurrence in printed English. For example, the easiest three words on the Word Identification subtest are *go, the,* and *me,* words of mid-level difficulty are *pioneer, inquire,* and *wealth,* and the hardest three are *epigraphist, facetious,* and *shillelagh.*

Neither of these widely used tests place stringent time pressure on students, so both phonetic decoding processes and sight word processes can be used to identify words on these lists. Both tests have been normed nationally, and one of their strengths is that they allow a direct assessment of children's ability to identify words solely on the basis of the word's spelling. When reading text, children also have context clues available to assist word identification, and thus text-based measures, although they may be more "authentic" in one sense, are less direct in their assessment of the kinds of word-processing skills that are particularly deficient in children with reading problems.

Phonetic reading ability. The single best measure of children's ability to apply knowledge of letter-sound correspondences in decoding words is provided by measures of nonword reading (Share & Stanovich, 1995). The Word Attack subtest of the *Woodcock Reading Mastery Test-Revised* (Woodcock, 1987) is a good example of this kind of diagnostic test. It consists of a series of increasingly complex nonwords that children are asked to "sound out as best they can." The three easiest items on the test are *ree, ip,* and *din;* items of moderate difficulty are *rejune, depine,* and *viv;* and the three hardest items are *pnir, ceisminadolt,* and *byrcal.* Because the words are presented out of context, they stress the child's ability to fully analyze each word to produce the correct pronunciation. On the other hand, measures such as this do not allow an assessment of children's ability to combine phonetic decoding with use of context to arrive at a word's correct pronunciation. However, since both good and poor readers appear able to use context equally well (as long as the context is understood, Share & Stanovich, 1995), this is not an important omission on a diagnostic measure of word reading ability.

Word reading fluency. Word reading fluency measures have typically measured rate of reading connected text. One of the more widely used measures in this area is the *Gray Oral Reading Test-3rd Edition.* (Wiederholt & Bryant, 1992). This test consists of thirteen increasingly difficult passages, each followed by five comprehension questions. A measure of oral reading rate is obtained by recording the time it takes for the child to read each passage. One potential problem with the Gray Oral Reading Test is that it does not provide a very sensitive measure of individual differences in word reading ability at very low levels of performance, such as those found in beginning first graders, or disabled readers through second grade. The passages simply begin at too high a level for children with very poor or undeveloped reading skills to display the word reading skills they actually possess.

In an effort to provide measures of fluency and accuracy in word reading skill that are simple to administer and sensitive to individual differences across a broad range of reading skills, we are currently developing simple measures of *Word Reading Efficiency* and *NonWord Efficiency* (Torgesen & Wagner, 1997). In both of these measures, children are shown lists of increasingly difficult words and nonwords and asked to read as many words as possible in forty-five seconds. There are two forms to each test, and the child's score is simply the average number of words read in forty-five seconds. Initial evaluations indicate that these measures are very reliable (parallel form reliabilities vary between .97 and .98 for kindergarten through fifth grade). They are also highly correlated with corresponding measures from the *Woodcock Reading Master Test-Revised* at early grades (when children often run out of words they can read before they run out of time, correlations range from .89 to .94) and slightly less correlated (.86 to .88) at fourth grade, when fluency of word reading processes becomes more important to performance on the tests. These tests have been standardized nationally and will be available from PRO-ED publishing company in late summer 1998. If a single form of each test is administered, it will provide indices of growth in phonetic decoding and sight word reading that can be administered several times during the year and that take a very short amount of time to give.

To summarize, adequate monitoring of the growth of children's word reading abilities should include out-of-context measures of word reading ability, phonetic decoding ability (as measured by ability to read nonwords), and word reading fluency. The fluency measures become more important after about second to third grade, when children have acquired a fund of word reading skills they can apply with reasonable accuracy. Measures that involve out-of-context word reading more directly assess the kinds of word reading skills that are particularly problematic for children with reading disabilities because they eliminate the contextual support on which these children rely heavily. To obtain a *complete* picture of overall reading development, however, it is also important to observe the way that the child integrates all sources of information about words in text, and this can only be estimated by carefully observing children as they read connected passages. □

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The White Door (Young Girl Reading at a Doorway), mezzotint by Peter Ilsted, courtesy of Theodore B. Donson, Ltd., New York

Detail from My Parents *by David Hockney, 1977 / Tate Gallery, London / Art Resource, NY*

At left, from Zaire, a silk-cotton wood figure of a man reading a book, believed to be a Swedish missionary, mid-19th century: Werner Forman / Art Resource; above: A seated youth reading from a "Wasli," from the large Clive Album, Isfahan, Mughal, c. 1620: Victoria & Albert Museum, London / UK/Bridgeman Art Library, London/New York; at right, a color woodblock print of a woman reading a letter: Utamaro (1754-1806): Scala / Art Resource

TEACHING DECODING

BY LOUISA C. MOATS

AS IT HAS become increasingly apparent that substantial numbers of children are failing to become skilled readers, a consensus is emerging among reading researchers, practitioners, and policy makers concerning the critical role that decoding plays in the reading process (Snow, Burns, & Griffin, 1998). Cognitive scientists have shown beyond doubt that fluent, accurate decoding is a hallmark of skilled reading (Adams, Treiman, & Pressley, 1997; Fletcher & Lyon, 1998; Rack, Snowling, & Olson, 1992; Share, 1995; Stanovich & Siegel, 1994; Vellutino, Scanlon, & Sipay, 1997). Automatic word recognition, which is dependent on phonic knowledge, allows the reader to attend to meaning; likewise, slow, belabored decoding overloads short-term memory and impedes comprehension.

While this renewed interest in phonics is certainly a welcome development, we will make limited progress unless decoding instruction is grounded in what we know about the stages of reading development, the structure of the English language, and the strategies students employ to learn it. With rare exception, classroom practice is not informed by these principles. As we shall see, problems abound not only with the approaches to decoding typically found in whole-language and "literature-based" programs but also with programs associated with traditional phonics.

Align Decoding Instruction with the Stages of Reading Development

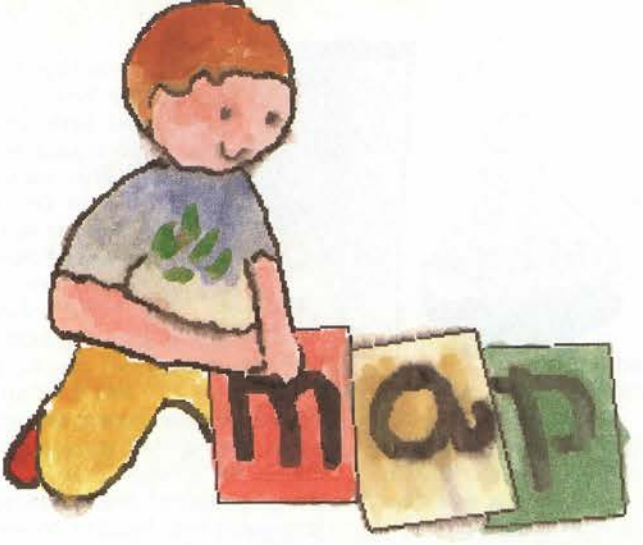
That decoding is learned early by good readers is established in studies of reading development (Chall, 1983; Cunningham & Stanovich, 1997; Ehri, 1994). The ability to sound out new words accounts for about 80 percent of the variance in first-grade reading comprehension, and continues to be a major factor in text comprehension as students progress through the grades (Foorman, Francis, Shaywitz, et al., 1997). Moreover, a series of studies have traced how beginners learn to read and spell words (e.g., Ehri, 1994; Treiman, 1993; Wagner & Barker, 1994). The learner progresses from global to analytic processing, from approximate to specific linking of sound and symbol, and from context-driven to print-driven reading as proficiency is acquired. The instruction we deliver should be compatible with the emerging competence of the student.

Logographic reading

Young children, typically before mid-kindergarten, may learn to recognize a limited vocabulary of whole words through incidental cues such as a picture, color, or shape (Ehri, 1994; Gough, Juel, & Griffith, 1992), but in this beginning stage of reading, do not associate sounds with symbols. Children will string letters together when they write and assign changing messages to them, or will look to context to guess at what a word says. A printed word may be remembered for its unique appearance, as in "pizza" or "D'Antoine." If asked about the sound that begins "pizza," however, the student might say "hot" or "m m m m." This visual cue reading typically precedes the insight that alphabet letters correspond to speech sounds. Children at this level have not realized that words are composed of phonemes, that letters represent those speech sounds, and that words can be decoded by matching symbol to sound.

Appropriate activities at the pre-alphabetic level include phonological awareness tasks (carried out orally) such as rhyming; counting, adding, and deleting syllables; matching beginning consonants in words; recognizing odd sounds; substituting sounds and identifying that a sound exists in selected words (Adams, Treiman, & Pressley, 1997; Brady, Fowler, Stone, & Winbury, 1994; Foorman et al., 1997; Torgesen, Wagner, & Rashotte, 1997). In addition, the development of print awareness includes alphabet matching and letter naming, following print with the finger during read-alouds, and much

Louisa C. Moats is project director of the District of Columbia site study for the National Institute of Child Health and Human Development Early Interventions Project, a five-year longitudinal study of early reading instruction conducted jointly between D.C. and Houston, with Dr. Barbara Foorman as principal investigator.



interactive engagement with appealing books. All these activities develop awareness of the alphabetic principle: that letters roughly represent segments of one's own speech.

Novice or early alphabetic reading

To progress in reading, children must develop the insight that alphabet letters represent abstract speech segments (phonemes) and must be able to compare the likeness and difference of similar-sounding words (Liberman, Shankweiler, & Liberman, 1989). Children begin to spell a few salient consonants in words when they write (KR/car; I LT G (I like to go); I LIK LAFFZ (I like elephants). Letter sounds and letter names such as /w/ and "Y", and /y/ and "U" may be confused. At this juncture, teaching affects the development of decoding strategies (Tunmer & Chapman, 1996); children may not develop the habit of sounding a word out unless they are taught how and are given sufficient practice. Instead, they may learn to rely excessively on pictures or context to decipher the pronunciation of unfamiliar words, a habit of doubtful utility (Adams, 1990; Iversen & Tunmer, 1993).[1]

Once an association between sound and letter(s) is taught, children need cumulative practice building words with letters they know. Systematic programs begin with a limited set of sound-symbol correspondences—a few consonants (b, f, h, j, k, m, p, t) and one or two vowels (ă, ĭ)—so that words can be built right away. Other consonants and vowels are added gradually to those already known. Vowels may be represented in a different color. Coupled with practice dividing words into phonemes and blending them back into wholes, children can build words with letter cards and play "chaining" games in which one sound is changed at a time to make a new word (*bat, bat, bit, bit, him, hip, hap, map*). The core activity in systematic, explicit decoding instruction is blending single sounds into words. After the children have learned a few sound-letter correspondences through a rhyme or other mnemonic, blending proceeds sequentially:

T. (Writing letter h on the board.) What's the sound?
S. /h/
T. (Writing letter a on the board.) What's the sound?
S. /ă/
T. Blend it. (Sweeping hand under the letters).
S. /hă/
T. (Writing letter t on the board.) What's the sound?
S. /t/
T. Blend it. (Sweeping hand under the letters).
S. /hăt/

After ten to fifteen words with known sound-symbol connections are blended, they are used immediately in sentences. Even if the written sentences are short, the teacher can ask the children to expand the sentences verbally, as in "Mat has a hat. Tell me what kind of hat he has!"

Mature alphabetic stage

At the next stage of early reading, children know associations for the basic sound-spellings and can use them to decipher simple words. Well-taught first graders achieve this by mid-year. When associations to letter patterns are secure, children can decode most predictable syllables. Attention to the internal structure of words, in both speech and spelling, supports whole word identification; it is linguistic awareness, not rote visual memory, that underlies memory for "sight" words after children enter this stage (Ehri, 1994; Share, 1995). As they become more automatic and efficient, children quickly begin to recognize the redundant "chunks" of orthography. Phonograms (ell, ack, ame, old) and word endings (-ing, -ed, -est) are read as units.

Orthographic stage: syllables and morphemes

Knowledge of sound-symbol associations and lots of practice reading contribute to fluency in word recognition. As whole words, morphemes, and print patterns become increasingly familiar, knowledge of these larger units of print allows students to read efficiently

[1] Once words are pronounced, meaning must be attached. The process of word identification is supported by sound-symbol decoding; the process of learning a word's meaning is supported by contextual analysis.

and spend less and less attention on sounding words out letter by letter (Share, 1995). At this stage, students read new words by analogy to known words (*build, guild*) especially if their teachers model and reinforce this strategy (Gaskins, Ehri, Cress et al., 1996). Beyond phonics, the study of word structures comprises syllables and morphemes, the units from which our Latin- and Greek-derived words are created (Henry, 1997).

Fluency in reading is gained by digesting many books at the right level—not too hard, not too easy. Authors invented "series" books for students at this stage, endless sagas of boxcar children, horses, and prairie characters that hook children into independent reading for themselves.

Within the sequence of early reading development, many strategies for reading instruction can fit. Learning to read unfolds predictably: Phoneme awareness, letter recognition, and concepts of print allow a child to learn the written alphabetic code; knowledge of the alphabetic code, beginning with the elemental units, allows fast, automatic word recognition; fast and accurate word recognition allows fluency in reading connected text for meaning; and comprehension is most likely when children can name the words, interpret the words, and employ various reasoning strategies to understand what they are reading. The question regarding decoding can then be reframed: What components of instruction are most effective with learners at what stage with what kind of teaching in what context and in relation to what other components? This, in fact, is the overarching question for the intervention studies supported by the National Institute of Child Health and Human Development (Lyon & Moats, 1997). Phoneme awareness instruction may no longer be helpful for students who can spell words phonetically; word families may "work" when students have the underpinnings of sound-symbol correspondence; repeated readings for fluency may be less effective if students do not know basic phonics, and so forth. Scientific investigation, with deliberate testing of competing hypotheses, will eventually map best practice at each stage. Given what we already know about language and how students learn it, however, what are the principles by which we should teach children to read the print?

Align Decoding Instruction with the Structure of the English Language

Put the spelling system in historical perspective.

Our writing system is an amalgam of Anglo-Saxon, Latin, and Greek, and to a lesser extent, includes spellings from French, German, Italian, and Spanish. Each of these languages contributed spelling conventions that within the language of origin were predictable but that violate the patterns of another. For example, *ch* is used to spell /ch/ in Anglo-Saxon words such as *chair;* is used to spell /k/ in Greek-derived words such as *chorus;* and spells /sh/ in French-derived words such as *charade* and *Charlotte.*

The Phoenicians and Greeks, over several centuries, invented the alphabet first to spell consonant phonemes and then, later, to include vowels. The system they invented, when appropriated by the Romans and spread throughout Europe, was used creatively by scribes to accommodate evolutions in language pronunciation and the interweaving of several languages that became Modern English. Our brand of English has at least forty speech sounds or phonemes: twenty-five consonants and fifteen vowels. (The official count of phonemes is different in every linguistics textbook, evidence itself of the abstractness and difficulty of phoneme classification.)

Scribes who appropriated the Greco-Roman alphabet for Germanic Anglo-Saxon words were equipped with an insufficient number of letters for the phonemes, a problem they solved by combining letters to use as spelling units (graphemes), such as *wh, th, sh, ch, oi, ou,* and *aw,* and using letters for several jobs. The letter *y*, for example, has four spelling jobs: it spells a consonant /y/ at the beginnings of words such as *yes*, and spells three vowels—/ĭ/ in Greek-derived words such as *gym*; /ē/ at the ends of two-syllable words such as *baby*; and /ī/at the ends of one-syllable words such as *cry, why,* and *by.* Further, the scribes gradually developed conventions for letter sequences. Certain spellings would be used for sounds in specified locations only. For example, when single-syllable words ended in /f/, /s/, /l/, or /z/, the consonant letters would be doubled, as in *stiff, mess, full,* and *jazz.* The sound /s/ could be spelled with *s* or *c* followed by *e, i,* or *y*. Although the possibilities for vowel spellings were more varied, those also were used within constraints. For example, *oi* was used only when the vowel occurred before a consonant (*toil, coin*); *oy* was used at the ends of words (*soy, cloy*).

The relational units of English orthography—the written symbols for sounds—are not simply single letters. English does not use a phonetic alphabet, wherein one letter represents a speech sound. It does use a deep alphabetic system that shows speech sounds and meaningful units, often in a somewhat complex and variant manner, directly related to the history of the English language.

Teach speech to print, not print to speech.

One of the most fundamental flaws found in almost all phonics programs, including traditional ones, is that they teach the code backwards. That is, they go from letter to sound instead of from sound to letter. Such programs disregard the fact that speech evolved at

least 30,000 years before writing. Alphabetic writing was invented to represent speech; speech was not learned from reading. Following the logic of history, we should teach awareness of the sound system (phonology) and anchor letters to it.

The print-to-sound (conventional phonics) approach leaves gaps, invites confusion, and creates inefficiences.[2] The first problem with such a system is its incompleteness; it typically teaches only part of the code. This is because instruction follows from the alphabet sequence and the sounds of its 26 letters. However, if beginning instruction in decoding is organized around the alphabet letter-sounds, the identities of consonants */wh/*, */th/* (voiceless), */th/* (voiced), */sh/*, */ch/*, */ng/*, */zh/*, and vowels */oi/*, */ou/*, */aw/*, */o͝o/*, and */ə/* (schwa) are obscured because no single letters of the alphabet represent these phonemes. Twelve phonemes out of 40 remain "hidden" when the alphabet is the organizing basis of instruction. A few letters also have no defined job. The letter *q* is redundant for /k/ and /s/. The letter *c* is redundant for the sound of /k/, and the letter *x* redundant for the combination /ks/ or the phoneme /z/.

The alphabet-to-sound approach in phonics instruction also overlooks the fact that some letter names bear little relationship to the sounds the letters represent and interfere with learning the sounds. If the child learns letter names without a clear conceptual and associative emphasis on the sounds the letters symbolize, confusions in reading and/or spelling will occur. Consider these pairs:

Letter	Name	Sound	Typical Reading Errors	Typical Spelling Errors
Y	/wī/	/y/	will = yell	YL (will) BOU (boy)
U	/yū/	/ū/	use = us	UESTRDA/yesterday
W	/double yu/	/w/	when =	UEN
X	/eks/	/ks/ or /z/	exam =	ECKSAM
H	/aitch/	/h/	watch =	WOH

In the first example, the first grader who recently read me the word "yell" as "will" needed much more practice differentiating letter sounds from letter names. Likewise, the children who confused the name "Y" with the sounds of /w/ and /yū/ was unaware of the difference. The child who did not know how to spell /ch/ turned to the letter name that has that sound in it: "aitch" (H). In the phonics lesson, children would not have pronounced the first sound of "laugh" as "el" and the first sound of "fish" as "ef" if they had been clear about these associations. However, such responses are common unless children are routinely and explicitly expected to distinguish letter names from sounds, especially during the early alphabetic stage of reading.

The alphabet orientation to phonics underlies the "word wall" idea that has proliferated in primary classrooms. Alphabet letters are posted along a colorful bulletin board; under each are high-frequency words for which children are to develop automatic recognition. The resulting array typically includes lists of words under the vowel letters such as:

[2] A point developed in great detail by Diane McGuinness (1997).

Aa	Ee	Ii	Oo	Uu
apple	egg	it	orange	under
and	eight	is	of	use
away	eat	in	on	us
all	end	I'm	out	united
are			once	
			open	
			off	

What can a child conclude who is shown that words starting with the letter "o" begin with as many as six different sounds, including the /w/ in *one* and *once?* Any observant child would surmise that letters are irrelevant to sound and must be learned by some magical memory process. The display directs children away from a sound-symbol connection and toward a rote, visual-cue orientation, like that taken by my student whose decoding approach was to "look harder at the word." Sight words do need to be learned, gradually and cumulatively, but bulletin board space can be used to better advantage for predictable patterns and correspondences.

How much easier and more logical to teach children each sound, then anchor the sound to a grapheme (letter, letter group, or letter sequence) with a keyword mnemonic (see chart below). This mimics the way alphabetic writing was invented. The sound /s/, then, would be associated first with "snake" and the letter *s,* and later with the *ci* and *ce* combinations (*city, race*). With an instructional goal of teaching eighty to 120 spellings for forty phonemes, and then moving to syllables and morphemes, teachers can teach the whole system in a comprehensive, clear, logical sequence over several years. Instruction can begin with high-utility, low-complexity consonant and vowel units, and move gradually to less common, conditional, and more complex graphemes. Spelling units of several letters (-tch, -igh, -mb, ce-, -ough) will be treated as the blocks from which words are built, rather than as mysterious combinations of "sounded" and "unsounded" letters.

Consonant spellings, sound-to-symbol organization:

/p/	/b/	/t/	/d/	/k/	/g/
pot	bat	tent	dime	cup	go
		walked	stayed	kettle	ghost
				deck	fatique
				school	
				oblique	

/f/	/v/	/th/	/s/	/z/	/sh/
fish	very	thin	see	zoo	shop
phone		then	fuss	jazz	sure
stiff			city	Xerox	Chicago
tough			science	rose	-tion, -sion

/ch/	/j/	/m/	/n/	/ng/	/h/
cheer	judge	man	net	king	hair
batch	wage	tomb	knight	lanky	who
	gent, gym	autumn	sign		
	gist				

/l/	/r/	/y/	/w/	/wh/
lake	run	yes	want	whistle
tell	wrist	use	one	

With the sound to spelling approach, spelling units (graphemes) are used to represent the forty sounds and often are more than one letter. For example, "eight" has two phonemes and two graphemes—the vowel /ā/ spelled *eigh* (also in *weigh, weight, sleigh*) and the consonant /t/. Teachers are less likely to try to "blend" /t/ + /h/ to make /th/ or /s/ + /h/ to make /sh/ if the letter combinations are understood to operate as symbolic units known as digraphs. I taught for years before a linguist showed me that *ng* stood for one nasal speech sound that shared features with /m/ and /n/ but was different from each. Surprise: it was not a blend of /n/ + /g/! The word *thank* included this phoneme, spelled with the letter *n*.

A few orthographic rules or patterns are somewhat arbitrary and do not relate to sound. For example, no words in English can end in *v* or *j*. Thus, all words ending in /v/, regardless of the vowel sound preceding the /v/, must have an *e* on the end (*love, dove, shove, live, give, grieve, leave*). Unfortunately, many words such as *give* are taught to children as "sight" or "outlaw" words, in spite of the fact that they are completely regular by orthographic rule. Similarly, all words ending in /j/ must spell it *ge* or *dge; dge* occurs only after accented short vowels (*dodge, wedge, badge, ridge, fudge*). A word such as *Raj* is clearly non-English for this reason.

Teach word study beyond second grade.

Understanding word structure for reading, vocabulary and spelling necessitates knowledge of syllable patterns and morphology, grist for the fourth-grade mill and beyond. Good readers will learn to parse longer words into segments, if necessary, supply accent, and relate familiar word parts to meaning when possible. Each level of orthography—sounds, syllables, and morphemes—has its own organization, and each of those levels will differ according to the language from which a word was derived. Thus, the comprehensive domain of word structure (Henry, 1989, 1997; Bear, Templeton, Invernizzi, & Johnson, 1996) will be part of language teaching through at least sixth grade.

Learning the structure of words at the syllable and morpheme levels supports word recognition, spelling, and vocabulary development (Nagy & Anderson, 1984). About 60 percent of the words in English running text are of Latin or Greek origin (Henry, 1997). The meaningful parts (morphemes) of these words are often recombined with others in compounds and affixed forms and are thus extremely productive; many words can be deciphered from a few familiar parts. Roots such as *scribe, rupt, struct,* and *port* are each found in scores of related words. For example, students who know that *rupt* means *to break* will find it much easier to add words such as *erupt, corrupt, disrupt, interrupt, rupture,* and *bankrupt* to their vocabulary.

Children learn all of these patterns in a more or less predictable sequence (Templeton & Bear, 1994). Syllables without consonant blends are easier than syllable structures that include consonant blends (e.g., *am, Sam, slam, lamp, clamp, scram, cramps* represent progressive levels of complexity). Patterns within words are learned before the patterns of syllable combination. Inflectional morphemes (word endings) are learned before derivational morphemes (Latin roots, prefixes, suffixes). If word study lessons include a hodge-podge of thematically related but structurally unrelated words (*weather, cloudy, precipitation, solar, atmosphere*), children will not be exposed to enough examples of structural relationships in the orthography (as in *solar, insolation*) to internalize them.

LAYER OF LANGUAGE	Sound	Syllable	Morpheme
Anglo-Saxon	Consonants single blends digraphs Vowels short long (v-c-e) teams diphthong r-control	closed open v-c-e r-control c-le vowel team (schwa)	compounds (*bigblight; scatterbrain*) inflections (*-ed, -s, -ing, -er, -est*)
Romance (Latin)			prefixes (*mis-; in-*) suffixes (*-ment; -ary*) roots (*-fer, -tract*) plurals (*curricula; alumnae*)
Greek	/ī/ = y (*gym*) /k/= ch (*chorus*) /f/= ph (*photo*)		combining forms: (*biography, micrometer*) plurals (*crises, metamorphoses*)

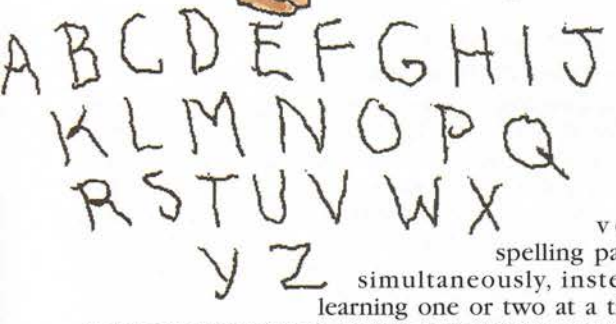
Teach the Code the Way Children Learn It Most Easily

Teach explicitly and systematically.

Systematic, explicit instruction leaves little to chance and thus ensures the success of most children. The phonic elements are taught in a logical order, simple to complex, informed by the structure of language itself. Predictable, common correspondences are taught before the variant, less common correspondences. One linguistic concept at a time, a sound or a spelling, is spotlighted in a lesson and constitutes the organizing principle of the lesson. That component of language is then contrasted with others that are potentially confusable (*yell/well; yak/ whack*) based on catalogues of typical children's errors (Treiman, 1993). The sound-symbol unit is then read and spelled in words; those words, in turn, are couched in sentences; and the sentences, in turn, are placed in simple stories. Automatic association of symbol with sound is the outcome, the foundation of fluent reading for meaning.

Systematic, explicit instruction contrasts with inci-

dental, implicit instruction. In incidental teaching, sound-symbol elements are taught without intention to follow a sequence from easier to more difficult. A phonic element or pattern may be pointed out by a teacher in the context of words in a book (e.g., find the /ē/ in *James and the Giant Peach*). The student would not learn that *ea* is a less predictable spelling than *ee* and would be exposed to many



vowel spelling patterns simultaneously, instead of learning one or two at a time in order of predictable to variant. In implicit teaching, the sound stays embedded in whole words, not sounded in isolation or contrasted with other vowels. For example, a student might be asked to infer that the middle sound of *peach* is /ē/ and that it is spelled with *ea*, but for implicit instruction to result in learning, the child must already be able to do what the task presumably teaches: to match a phoneme with a grapheme and differentiate it from others.

The "mini-lesson" approach, whereby a phonic element is illustrated after reading has been practiced, is often incidental and implicit (Cooper, 1997). Without very strong preparation, teachers who teach phonics as a supplement may provide disconnected drills that provide too little information about the system being learned and too little practice with each component. If a teacher runs her first graders through the list *bug, tug, hug, mug, hum, drum, such, tuck, duck, stuck,* and *much*, without ever identifying the vowel in contrast to others, spelling the words, blending the sounds together, or reading the words in books, the activity may be a write-off. If students learn this way, it may be in spite of the way we teach them.

In systematic code instruction, decodable books are used that are aligned with the sound-symbol association taught in the lesson. These books, created to make independent reading possible for a beginner, are a device to provide practice reading words that have specific spelling patterns or letter-sound correspondences and to encourage sounding words out. Many children can retain new sound-spelling patterns only with cumulative, distributed practice. Several recent studies have shown an advantage for early reading programs that include decodable texts (Felton, 1993; Foorman et al., 1998; Iversen & Tunmer, 1993; Juel & Roper-Schneider, 1985), and at least one shows a disadvantage for "predictable" books that are not organized to provide practice with phonic patterns (Johnston, 1998).

Decodable text includes a high percentage of words with the phonic associations already taught and a few high-frequency sight words that make the sentences less stilted. Contrary to the negative stereotype "Dan Can Fan the Man," decodable text can be appealing. Adult distaste for decodable books fails to respect the child's need to exercise a skill: Children want to be self-reliant readers and are delighted when they can apply what they know. Creative solutions to contrived language patterns include interspersing text for an adult to read with text for the child to read, using attractive illustrations, and developing a good story line.

Of course, the use of decodable text should never replace oral reading of quality literature in a comprehensive reading program. Indeed, this is a good juncture at which to point out that, while this article discusses the decoding aspect of reading, a comprehensive reading program attends to meaning and comprehension from the start. Oral language development, vocabulary development, the steady building of background knowledge, extensive exposure to quality children's literature, discussion and retelling and dramatization of stories should begin with the earliest years of preschool. At each succeeding level, students can learn and practice simple comprehension strategies that will help secure their understanding of text. And at every stage of their schooling, children should be surrounded by books and take part in a wide and engaging array of print experiences.

Teach pattern recognition, not rule memorization.

Most individuals learn to decode words in print because they accumulate explicit and tacit knowledge of linguistic patterns—phonological, orthographic, and morphological. Any audience of literate adults can be cajoled into displaying their unconscious knowledge of orthographic constraints. Ask a group to spell "throige." The majority will use *oi,* not *oy,* although many will have trouble explaining that *oi* is used in the middle of words for /oi/, and *oy* is used at the end of words. Most will also use *ge* instead of *dge,* because a diphthong (vowel with a glide) is never followed by "dge." If a group is asked to read a nonword such as "pertollic," the middle syllable will be stressed and the vowel /ŏ/ will be short. Readers of English know intrinsically that in the Latin layer of the language, the root is usually stressed, not the prefix or suffix, and a doubled consonant following a vowel causes it to be short.

Awareness and use of such organizational patterns, not memorization of rules, facilitates learning; the goal of insight is to read more fluently, not to recite orthographic trivia. Sometimes critics of phonics instruction lament that there are too many rules to teach, the rules don't always apply, or the rules are too complicated to be taught. This criticism is apt if the correspondence system is conceived as a series of letter sequence rules, instead of a layered system for representing both sound and meaning. Examples abound:[3]

[3] These are from Lapp & Flood, but many others can be found.

If a vowel letter is at the end of the word, the letter usually stands for the long sound.

W is sometimes a vowel and follows the vowel digraph rule.

The letter *a* has the same sound when followed by *l*, *w*, and *u*.

These observations, among many others, obscure what is at work in speech-to-print correspondence and are not what children should be asked to learn. With reference to the first of these "rules," children can simply sort, read, and spell groups of words that share a single-letter, long-vowel spelling: *me, he, she, we, be; go, so, no,* and *yo-yo.* With reference to the second, the letter W is never a vowel; it is used in vowel digraphs *aw, ow, ew.* As for the third, it makes more sense to explain that *aw* and *au* are two spellings for /aw/ and give students practice sorting, reading, and writing many examples to discover the system. *Au* is used internally in a syllable (*applaud, laundry, taut*), and *aw* is used in word-final position and before word-final /n/ and /l/ (*saw, thaw; brawn, brawl; drawn, drawl*). Part of teaching decoding well is to select what is useful, understandable, and applicable and represent it as directly and logically as possible.

What does worthwhile practice entail, beyond phoneme awareness, sound-symbol linkage, and sound blending? Many teaching strategies apply. Words can be analyzed in a student-teacher dialogue so that their structures are discovered and then generalized to new words; patterns may be sorted so that groups of words are compared and classified (see Templeton, Bear, Invernizzi, and Johnson, 1996); phonic concepts may be applied to reading "foreign" words, names, low frequency words, or nonwords; and sentence completion exercises can require students to make fine discriminations of words that look or sound alike in text reading. Writing words after reading them reinforces pattern knowledge. Some children with significant reading impairments need to be taught every code element explicitly, but others will begin to generalize independently if they have a solid basis from which to proceed (Share, 1995). Thus, we teach the major spellings for /k/ as a beginning decoding skill (*c, k, ck*), but wait to highlight the Greek *ch* and the French *-que* until entries from those languages are considered as an etymological group (*chorus, orchestra, school, chlorox, pachyderm; antique, pique, mystique*).

Encourage active, constructive exploration.

Workbooks are great for independent practice when concepts have been well taught. They are not categorically despicable, just often misused as a substitute for teaching. Concepts, however, should be developed in the context of student-teacher interaction and activities designed to encourage reflection about language form. The brain responds to novelty and sensory involvement; that's why we learn better by doing than by listening. Some powerful approaches to phonological awareness, for example, emphasize mouth position and the ability to compare how words feel when they are spoken. Some decoding programs ask children to stand at the chalkboard and write words as they are analyzed, sounded out, and explained. Others use manipulative letters and trays. Still others give children small lap slates to write words as they are created, dictated, or illustrated on an overhead. Letter cards can be manipulated in personal pocket charts that are made with manila folders. Hand gestures are employed for sweeping through sounds and blending them into words. All of these active techniques require the learner to select, classify, and consciously manipulate sounds and letters so that more thorough word learning occurs.

Anticipate, prevent, and correct confusions.

Sound representation. Organizing and sequencing the content is only the beginning of good decoding instruction. Ensuring that code associations become useful for children is yet another challenge, one for which few teachers are well prepared because our training did not emphasize the specifics (Moats, 1995). Just speaking the phonemes can be tricky. Phonemes combined in words are not what they become in isolation. Coarticulation—the folding of speech sounds into one another in natural speech—makes the identity of single phonemes an abstract exercise for the learner. But the closer the teacher gets to producing a "pure" form of the phoneme, a prototype that can be used for classification, the easier it is for the learner to establish a point of reference. When teachers ask the class to blend "kuh, a, ruh" only the lucky students will recover "car." On the other hand, if they say /k/ - /ar/, blending can result in "car." If the teacher says "fuh, a, tuh" only the children who can already spell are likely to blend "fat." /f/ /ă/ /t/, however, is closer to the real thing.

Knowing the basics of language structure can boost any teacher's effectiveness. For example, let's look at consonant features. What phonics books seldom tell us is that nine consonant pairs in English differ only in a feature called voicing. The consonants are spoken in the same manner but one of the pair is quiet (voiceless) and the other is vocalized (voiced). The pairs, and words that contrast because of those consonants, are:

/p/, /b/	pest, best
/t/, /d/	tide, died
/k/, /g/	cut, gut
/f/, /v/	ferry, very
/ th/, /th/	bath, bathe
/s/, /z/	fussy, fuzzy
/sh/, /zh/	fission, vision
/ch/, /j/	batch, badge
/wh/, /w/	whether, weather

Children learning to decode and spell often confuse these consonant pairs. An excerpt from Samantha's composition in third grade included the words HOSPIDAL/hospital, UNGL/uncle, EFRY/every, and LONJ/lunch. Clearly, no one had been clear with her about the voicing feature of consonants. A knowledgeable instructor could ask Sam to articulate the phonemes, look in a mirror, feel her own throat for res-

onance, and ask Sam to identify which sound was spoken in target words. Sam should read and spell contrasting pairs of words designed to highlight the distinctions before she practices them in context to be sure the speech basis for spelling is established.

Ryan, in first grade, sat through a well-taught lesson on the speech sound /ch/ and then returned to his desk to write: *Chuck lix to ent some jele and some joclet.* (Chuck likes to eat some chili and some chocolate). Rather than confusing /ch/ with the fricative /sh/, as the teacher anticipated, he confused it with its voiced equivalent, /j/. Ryan needed to be shown again that /ch/ is quiet and /j/ is noisy or sounded, and needed practice reading and spelling words with each of these sounds.

It is because children do confuse similar speech sounds that their features may need to be spotlighted. Accurate word learning requires identification of the sounds and letters in the word. Without such clarity, meanings are harder to learn; *build, built,* and *bill* differ only by one phoneme, as do *bruise* and *breeze,* and *goal* and *gold.* One of my fifth graders, years ago, was sure for weeks that the Gold Rush had something to do with soccer ("goal rush"), a semantic confusion directly tied to phonological unawareness.

To be able to analyze children's confusions and errors, teachers need to know sounds, spellings, and syllables. Otherwise selection of appropriate examples is impossible. Creative but pointless strategies abound, especially in vowel instruction. "Egg" is not a great keyword for /ĕ/. *Edward, echo, etch,* and *bed* are all better bets. Chanting "long vowels, short vowels, rah rah rah" with wild hand gestures, as I have seen, might build enthusiasm but not reading skill. The word "arm" does not have a "long a" in it. The abbreviation *Mrs.* is not a consonant-vowel-consonant configuration, as a national reading expert was recently seen to claim. And *kiss* is not a two-syllable word. Poor examples arise from forcing vowels into two arbitrary categories rather than teaching the whole system of vowel production and representation. Programs that define vowels as 6 letters are missing the essence: Vowels are 15 open sounds around which syllables are organized. Every syllable has one vowel sound, even though print does not correspond as directly as we would like.

Corrective feedback. Children's misperceptions can often be resolved quickly and effectively if feedback leads to insight about how language works. Targeted feedback, however, requires understanding of language and confidence that, armed with good strategies, children can figure out new words. If a child reads "net" and the word is "neat," the first comment from the teacher might be "ea says /ē/ in this word; now try to blend it." Such feedback supports the learner and reinforces the idea that sounding out is generally possible if context is used as a backup. Asking children to say the letters they see, refer to a keyword mnemonic for a sound, or recognize a familiar part of a word (*eat* in *neat*) all reinforce the habit of looking carefully at words before guessing or skipping.

The Current Trend

One of the most ironic consequences of the current trend in publishing is the reappearance of workbooks and readers intended to "supplement" whole-language classroom reading programs. The original design of many programs omitted or obscured instruction in phoneme awareness, letter recognition, sound-symbol association, blending and word attack, spelling, and the application of phonics in reading decodable text. Millions of dollars were invested by schools in the literature-based basals of the early 1990s and they will not be discarded lightly. Districts will be tempted to spend money on gap-filling phonics, phoneme awareness, and spelling kits that will have to be taught as separate components of a language arts block rather than as integrated parts of a coherent lesson. Fragmentation of instruction is a likely consequence—the very problem that whole-language programs were designed to combat.

One of the consequences of fragmentation in lesson design and curriculum is inefficiency. It will take longer to teach children what they need to learn; it will be less likely that all children who are capable will learn to read well. Although needed skills may be addressed if combinations of core programs and their supplements are used, the whole process may take longer than necessary and result in superficial learning. Better results are obtained if the necessity of code instruction is confronted early, directly, and wisely.

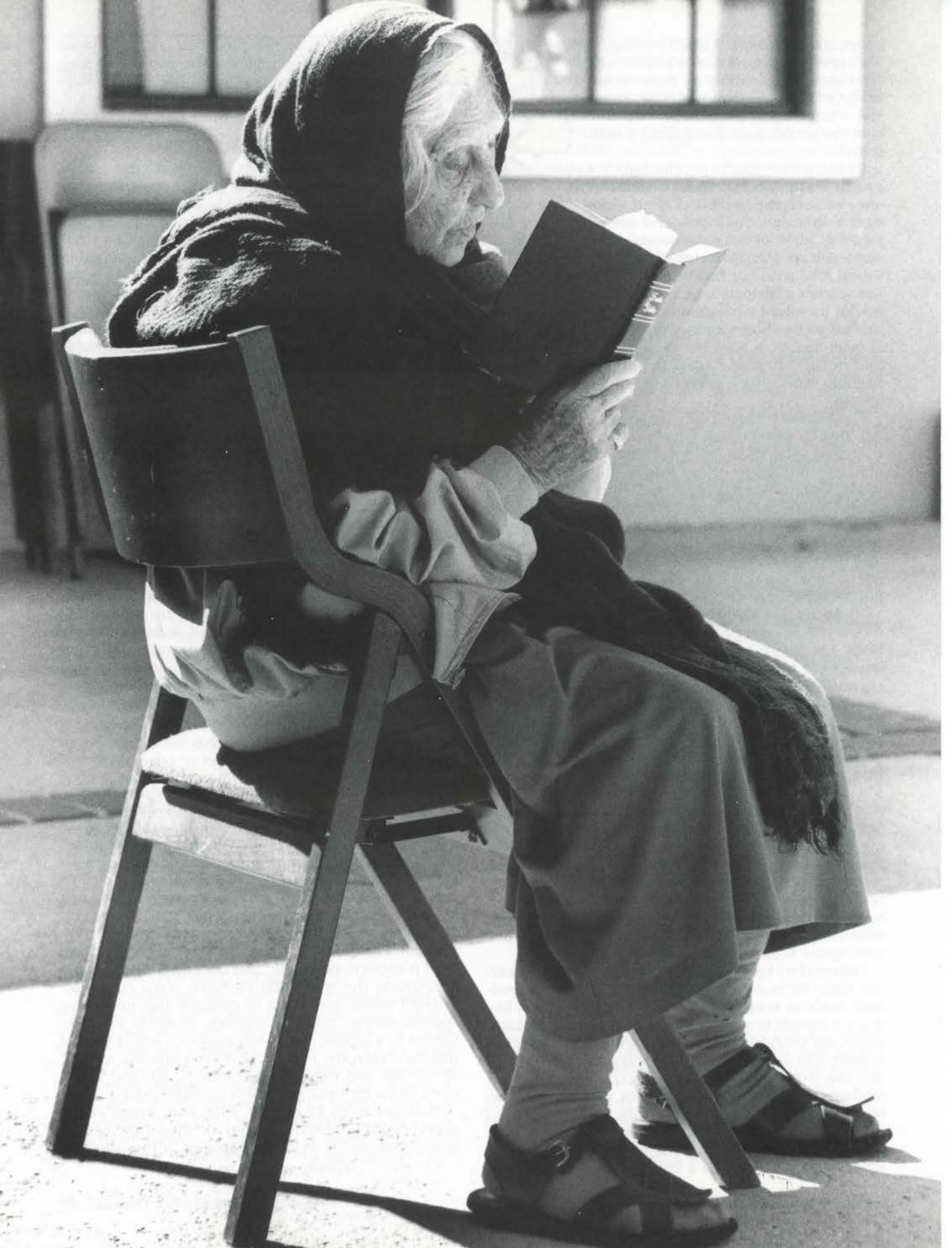
Summary

Decoding instruction might be termed the "technical" part of teaching reading. It requires knowledge of language, including phonology and the structure of orthography; knowledge of how children learn language; and strategies for teaching a writing system incrementally even as the purpose of reading is kept in focus.

In a well-designed and executed program, decoding is taught in relation to the student's stage of reading development. The inherent structure of language provides the scaffold for program organization. Teaching itself is explicit, systematic, and connected to meaning. It respects the ways that children learn language, through active extraction of patterns and successive approximations. Selected linguistic elements are highlighted in a lesson. The lesson teaches a sound-symbol pattern within the context of many examples applied to reading and writing single words, sentences, and texts. Blending sounds in words is emphasized.

Students learn to rely on what they know about speech-print connections. They develop fluency and independence in word recognition with sufficient

(Continued on page 95)



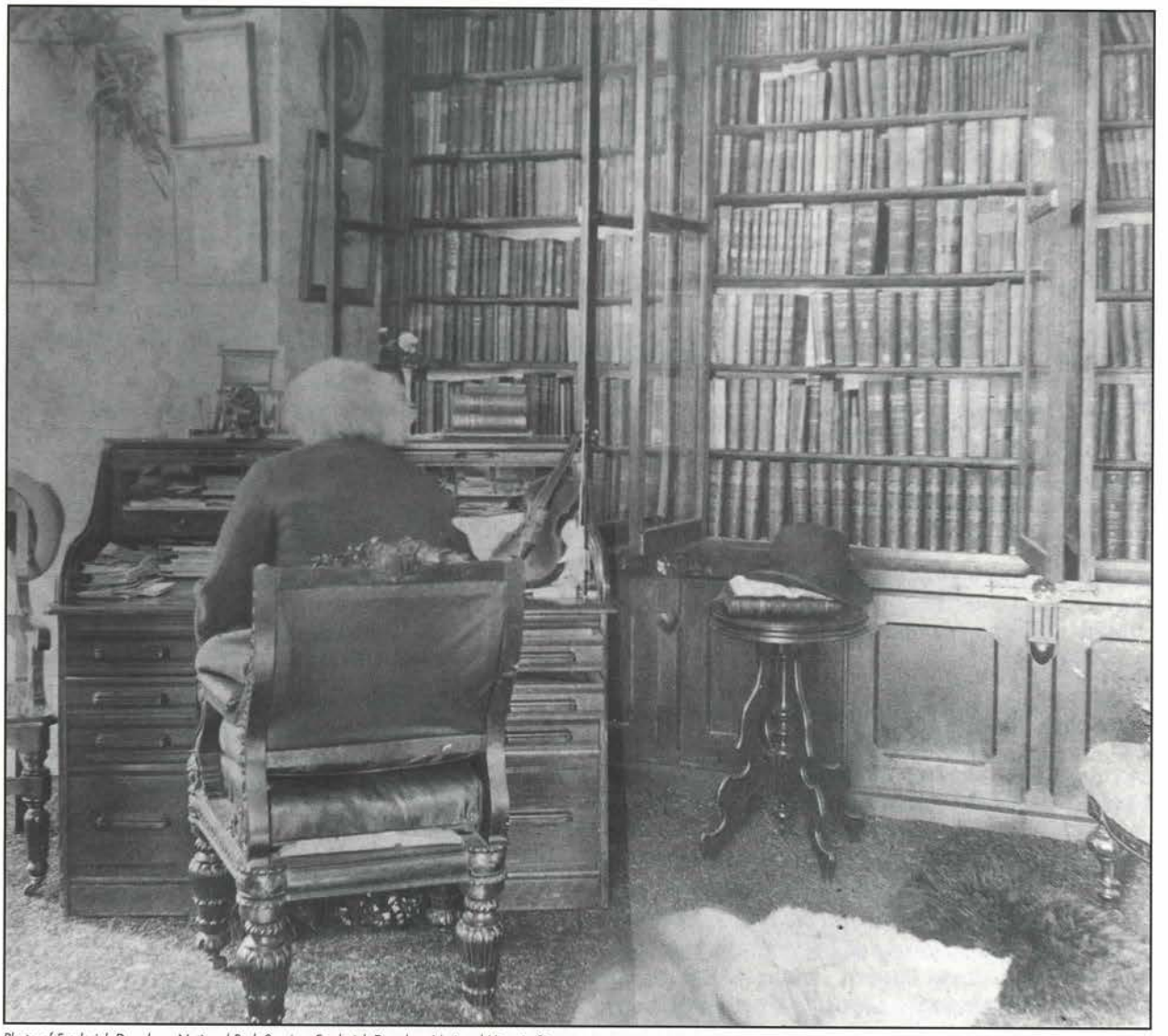
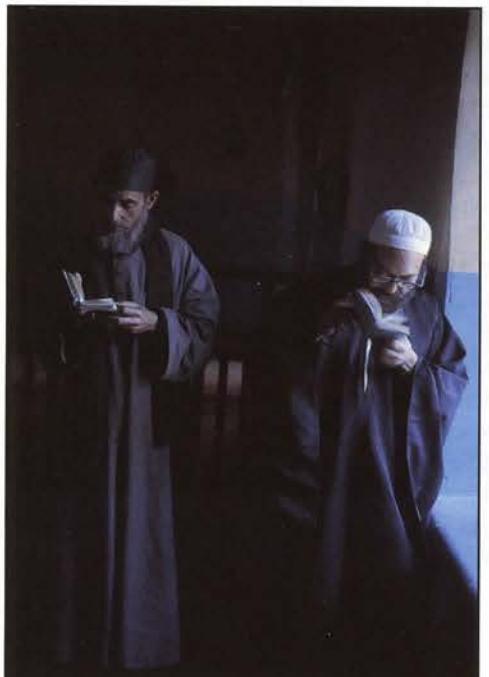


Photo of Frederick Douglass: National Park Service, Frederick Douglass National Historic Site



Above, from Library: The Drama Within, *by the author and photographer, Diane Asseo Griliches, published by the University of New Mexico Press, 1996; at left, morning prayer at St. Anthony Monastery in Egypt's eastern desert: Fred J. Maroon / FOLIO, Inc.*

A survivor of the January 17, 1994 Northridge, California, earthquake reads her morning prayers in the courtyard of a Salvation Army shelter in Van Nuys: ©1994 Tara C. Patty

EVERY CHILD READING

An Action Plan of the Learning First Alliance

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Editor's Note: Reprinted here is the major portion of "Every Child Reading." To order the full publication, which includes a more detailed "action plan," contact Lydia Ellis in the AFT educational issues department, either by phone (202/393-5684) or e-mail (lellis@aft.org).

Why Reading Reform Is Essential

Every educator, parent, and child knows that reading is the most important skill taught in elementary school.

The number of children who are poor readers is debated, but one widely accepted indicator is that 40 percent of all U.S. nine-year-olds score below the "basic" level on the National Assessment of Educational Progress (NAEP). Whatever the definition, the number of poor readers in our society is too high. Reading failure is overwhelmingly the most significant reason that children are retained, assigned to special education, or given long-term remedial services.

In addition to the large number of poor readers, there is a continuing gap between white students and African-American and Hispanic students. In 1994, 31 percent of white fourth graders scored below "basic," while 69 percent of African-American and 64 percent of Hispanic students did. These differences have major consequences for

The Learning First Alliance is composed of the following organizations:

American Association of Colleges for Teacher Education
American Association of School Administrators
American Federation of Teachers
Association for Supervision and Curriculum Development
Council of Chief State School Officers
Education Commission of the States
National Association of State Boards of Education
National Association of Elementary School Principals
National Association of Secondary School Principals
National Education Association
National PTA
National School Boards Association

our society, as they lead to inequalities among this nation's students that last throughout their schooling and beyond.

The reading problems of U.S. children are not new. Overall reading performance has been more or less unchanged since 1972, when the first NAEP report was issued. The notion that we can simply return to some earlier "golden age of reading" is wrong. Still, while reading performance may not be declining, it is certainly not improving. In what other area of American life would we be satisfied that things had gotten no worse in 25 years? Moreover, we now know more than ever before about how to help virtually every child become a successful reader.

Every Child Reading: An Attainable Goal

Our goal is for all healthy children to learn to read well. With what we now know, this country's reading problems are largely solvable if we have the will to solve them.

Using techniques available today—and new approaches that research could readily produce and validate within a few years—we could ensure reading success for all but a tiny proportion of students. If we started today, we could ensure that virtually every healthy child born in the 21st century would be reading at or above the "basic level" on NAEP by age nine and that every child now in elementary school would graduate from high school a reader. We could also substantially increase the number of children reading at NAEP's "proficient" and "advanced" standards. Our goal as a nation must be no less.

What will it take to ensure the reading success of every child?

- Effective new materials, tools, and strategies for teachers.
- Extensive professional development to learn to use these strategies.
- Additional staff to reduce class sizes for reading instruction and to provide tutoring for students who fall behind.
- Changes in school organization for more appropriate class groupings and effective use of special education, Title I, and other supplementary resources.
- District, state, and national policies to set high standards of performance, to support effective classroom instruction, and to improve teacher training programs.
- Parents and other community members to support intensified efforts to improve the reading ability of all students.
- Parents and guardians to ensure that their children arrive at school ready to learn every day.

■ Intensified research.

No one of these reforms can do the job by itself, but all of these changes together can substantially increase reading success for all of America's children. These reforms will require that we use current resources in better, different ways. In particular, funds and personnel now devoted to professional development, inservice education, instructional time, research, and textbooks must be more sharply focused in the ways suggested below. In addition, these reforms will also require new resources—in such areas as pre-K, professional development, class-size reductions, and research.

Every Child Reading: A Research Base

In forging a strategy to ensure reading success for all, it is essential to focus on practices grounded in research.

After years of conflict between "whole language" and "phonics" advocates, a consensus about what works is emerging. The Learning First Alliance, made up of major education organizations, agreed to focus this white paper on reading practices based on strong research findings. Working with experts in the field, a draft paper was developed and adopted by the Learning First Summit in January 1998. Then, in Spring 1998, the National Research Council (NRC) of the National Academy of Sciences (NAS) completed a major review and synthesis of reading research, entitled *Preventing Reading Difficulties in Young Children.* Seventeen of the nation's leading experts served on that panel, and although they represented a wide spectrum of views, they did reach consensus and all signed off on the final report. The Alliance has referenced some of the NAS findings, when helpful, to amplify points made in this final Alliance document.

The Learning First Alliance sees its challenge as having to react quickly to new research information without falling victim to unsubstantiated fads. To meet this challenge, this paper relies heavily on quantitative research to inform key decisions that policy makers and educators must make to improve students' reading skills. This paper draws on evidence from such interdisciplinary fields as language, cognition, neurological sciences, and the psychology of reading. We pay special attention to studies of the reading achievement of children taught using one method to that of similar children taught by different methods. We also draw heavily on longitudinal work, which finds correlations between various teacher practices and children's reading or between children's early skills and knowledge and their later reading. These types of research, if replicated many times in many circumstances, can tell educators that, on average, one approach is likely to be more effective than another. Qualitative research, in contrast, offers valuable insights and directions for future research. It also helps us to understand what's behind the quantitative research. Yet qualitative research doesn't tell us what practices and programs can be successfully replicated, which is a fundamental need of our schools.

We firmly believe that without research, professionals cannot do their jobs well. Still, even relying on the best research available to make difficult decisions, it is important to keep two caveats in mind. First, the applications of research findings must be tempered by wisdom, experience, and sensitivity to the needs of a particular child or group of children. Second, research develops over time. What seems well established today may be challenged or modified by new findings tomorrow.

Keeping these limitations in mind, however, it is the responsibility of educators and policy makers to take advantage of the best available research and to use it as the basis for decisions about reading instruction and policy. The following sections summarize what the research says about the major types of reforms that are necessary to bring all children to high levels of literacy.

A. PREKINDERGARTEN AND KINDERGARTEN PROGRAMS

The foundations for reading success are formed long before a child reaches first grade.

Starting at infancy, parents and other care providers can give children a strong base of language concepts, cognitive skills related to print, and a love of books. Research on instruction in prekindergarten and kindergarten identifies the concepts and skills that

are the foundation of success in early reading and the instructional strategies that best help children to learn these concepts and skills.

Quality preschool experiences increase cognitive skills at entry to first grade. While these improved cognitive skills do not directly result in improved reading, they do prepare children to profit from high-quality reading instruction. Similarly, full-day kindergarten programs can increase children's cognitive skills and their readiness to profit from high-quality first-grade instruction.

Early diagnostic assessments, beginning as soon as kindergarten, can be a useful tool to assure immediate intervention for the children who are identified as being at risk of reading failure.

During pre-K and kindergarten, students should develop:

Language skills. At entry to first grade, students will need to have a broad array of language experiences under their belts. Oral language, vocabulary, and other language concepts are crucial foundations for success in reading, especially reading comprehension. In particular, children need to be able to use language to describe their experiences, to predict what will happen in the future, and to talk about events that happened in the past. Early childhood programs can develop children's language by giving them many opportunities to discuss their experiences, make predictions, and discuss past events in small groups. Many children also benefit from instruction in key language concepts, such as colors and shapes, prepositions (e.g., under/over, before/after), sequence (e.g., small to large), and classification (e.g., animals, containers, and plants).

Background knowledge. A key predictor of successful reading comprehension is background knowledge. Children need knowledge and understanding of their own world in order to make sense of what they read. In addition, children need to be exposed to content in science, history, and geography from an early age to give them a context for understanding what they read.

Appreciation of stories and books. Children need a great deal of experience with literature, as active listeners and as active participants. Storybook reading is a typical activity in prekindergarten and kindergarten. Research shows that the details of storybook reading matter. In reading to children, teachers should stop to let children discuss how the characters feel and what they want to do, and make predictions about how stories will end. They should help children to actively explore the meaning of new words and concepts. They should give children opportunities to retell the text after hearing it, giving them a chance to use the story's new words and language and to put pictures of the story's events in the right order. Book reading should include nonfiction as well as fiction selections.

Concepts of print. Children need to know that stories and other texts are written from left to right, that spaces between words matter, and that there is a one-to-one correspondence between the words on a page and the words the reader says.

Phonemic awareness. One of the most important foundations of reading success is phonemic awareness. Phonemes are the basic speech sounds that are represented by the letters of the alphabet, and phonemic awareness is the understanding that words are sequences of phonemes. Phonemic awareness is demonstrated by the ability to identify and manipulate the sounds within spoken words. Children can be taught to hear that "cat" is composed of three sounds: /k/, /a/, /t/. They can learn to assemble phonemes into words as well as break words into their phonemes even before they are writing letters or words.

Giving children experience with rhyming words in the preschool years is an effective first step toward building phonemic awareness. Hearing rhymes, and then producing rhymes for given words, requires children to focus on the sounds inside words. Later, more direct instruction on the individual sounds that make up words is needed. The goal is to have children start their more formal instruction in reading with a comfortable familiarity with the sounds that letters represent and with "hearing" those sounds within words.

Alphabet and letter sounds. One of the best foundations for early reading success is familiarity with the letters of the alphabet.

It is the responsibility of educators and policy makers to take advantage of the best available research and to use it as the basis for decisions.

Children can learn alphabet songs, match pictures or objects with initial letters, play games with letters and sounds, and so on. They can learn to recognize and print their names, the names of their classmates, and names of familiar objects in the classroom or home. As they gain command of letters and sounds, kindergarten children can begin to write simple stories. By the end of kindergarten, children should be able to recognize, name, print letters, and know the sounds they represent.

B. BEGINNING READING PROGRAMS

When it comes to reading, the nine months of first grade are arguably the most important in a student's schooling.

It is during first grade that most children define themselves as good or poor readers. Unfortunately, it is also in first grade where common instructional practices are arguably most inconsistent with the research findings. This gap is reflected in the basal programs most commonly used in first-grade classrooms. The National Academy of Sciences report found that the more neglected instructional components of basal series "are among those whose importance is most strongly supported by the research."

In this discussion, there are again certain caveats to keep in mind. There is no replacing passionate teachers who are keenly aware of how their students are learning; research will never be able to tell teachers exactly what to do for a given child on a given day. What research can tell teachers, and what teachers are hungry to know, is what the evidence shows will work most often with most children and what will help specific groups of children.

To integrate research-based instructional practices into their daily work, teachers need:

Training in alphabetic basics: To read, children must know how to blend isolated sounds into words; to write, they must know how to break words into their component sounds. First-grade students who don't yet know their letters and sounds will need special catch-up instruction. In addition to such phonemic awareness (see the discussion on phonemic awareness on p. 55), beginning readers must know their letters and have a basic understanding of how the letters of words, going from left to right, represent their sounds. First-grade classrooms must be designed to ensure that all children have a firm grasp of these basics before formal reading and spelling instruction begin.

A proper balance between phonics[1] and meaning in their instruction. In recent years, most educators have come to advocate a "balanced approach" to early reading instruction, promising attention to basic skills and exposure to rich literature. However, classroom practices of teachers, schools, and districts using "balanced approaches" vary widely.

Some teachers teach a little phonics on the side, perhaps using special materials for this purpose, while they primarily use basal reading programs that do not follow a strong sequence of phonics instruction. Others teach phonics "in context," which means stopping from time to time during reading or writing instruction to point out, for example, a short "a" or an application of the silent "e" rule. These instructional strategies work with some children but are not consistent with evidence about how to help children learn to read most effectively, especially those who are most at risk.

The National Academy of Sciences study, *Preventing Reading Difficulties in Young Children,* recommends first-grade instruction that provides explicit instruction and practice with sound structures that lead to familiarity with spelling-sound conventions and their use in identifying printed words. The bottom line is that all children have to learn to sound out words rather than relying on context and pictures as their primary strategies to determine meaning.

Does this mean that every child needs phonics instruction? Research shows that all proficient readers rely on deep and ready knowledge of spelling-sound correspondence while reading, whether this knowledge was specifically taught or simply inferred by students. Conversely, failure to learn to use spelling/sound correspondences to read and spell words is shown to be the most frequent and debilitating cause of reading difficulty. No one questions that many children do learn to read without any

[1] The term "phonics" is used in this document as it is widely understood by educators, to mean instruction that focuses on teaching the alphabetic principle and the sound-symbol correspondences.

direct classroom instruction in phonics. But many children, especially children from homes that are not language rich or who potentially have learning disabilities, do need more systematic instruction in word-attack strategies. Well-sequenced phonics instruction early in first grade has been shown to reduce the incidence of reading difficulty even as it accelerates the growth of the class as a whole. Given this, it is probably best to start all children, most especially in high-poverty areas, with explicit phonics instruction.

Such an approach does require continually monitoring children's progress both to allow those who are progressing quickly to move ahead before they become bored and to ensure that those who are having difficulties get the assistance they need.

Strong reading materials: Early in first grade, a child's reading materials should feature a high proportion of new words that use the letter-sound relationships they have been taught. It makes no sense to teach decoding strategies and then have children read materials in which these strategies won't work. While research does not specify the exact percentage of words children should be able to recognize or sound out, it is clear that most children will learn to read more effectively with books in which this percentage is high.

On this point, the National Academy of Sciences' report recommends that students should read "well-written and engaging texts that include words that children can decipher to give them the chance to apply their emerging skills." It further recommends that children practice reading independently with texts slightly below their frustration level and receive assistance with slightly more difficult texts.

If the books children read only give them rare opportunities to sound out words that are new to them, they are unlikely to use sounding out as a consistent strategy. A study comparing the achievement of two groups of average-ability first graders being taught phonics explicitly provides evidence of this. The group of children who used texts with a high proportion of words they could sound out learned to read much better than the group who had texts in which they could rarely apply the phonics they were being taught.

None of this should be read to mean that children should be reading meaningless or boring material. There is no need to return to "Dan can fan the man." It's as important that children find joy and meaning in reading as it is that they develop the skills they need. Research shows that the children who learn to read most effectively are the children who read the most and are most highly motivated to read.

The texts children read need to be as interesting and meaningful as possible. Still, at the very early stages, this is difficult. It isn't possible to write gripping fiction with only five letter sounds. But a meaningful context can be created by embedding decodable text in stories that provide other supports to build meaning and pleasure. For example, some early first-grade texts use pictures to represent words that students cannot yet decode. Others include a teacher text on each page, read by the teacher, parent, or other reader, which tells part of the story. The students then read their portion, which uses words containing the spelling-sound relationships they know. Between the two types of texts, a meaningful and interesting story can be told.

Strategies for teaching comprehension. Learning to read is not a linear process. Students do not need to learn to decode before they can learn to comprehend. Both skills should be taught at the same time from the earliest stages of reading instruction. Comprehension strategies can be taught using material that is read to children, as well as using material the children read themselves. Before reading, teachers can establish the purpose for the reading, review vocabulary, activate background knowledge, and encourage children to predict what the story will be about. During reading, teachers can direct children's attention to difficult or subtle dimensions of the text, point out difficult words and ideas, and ask them to identify problems and solutions. After reading, children may be asked to retell or summarize stories, to create graphic organizers (such as webs, cause-and-effect charts, or outlines), to put pictures of story events in order, and so on. Children can be taught specific metacognitive strategies, such as asking themselves on a regular basis whether what they are reading makes sense or whether there is a one-to-one match between the words they read and the words on the page.

It makes no sense to teach decoding strategies and then have children read materials in which these strategies won't work.

Writing programs. Creative writing instruction should begin in kindergarten and continue during first grade and beyond. Writing gives children opportunities to use their new reading competence, as well as being valuable in its own right. Research shows invented spelling to be a powerful means of leading students to internalize phonemic awareness and the alphabetic principle.

Still, while research shows that using invented spelling is not in conflict with teaching correct spelling, the National Academy of Sciences report does recommend that conventionally correct spelling be developed through "focused instruction and practice" at the same time students use invented spelling. The Academy report further recommends that "primary grade children should be expected to spell previously studied words and spelling patterns correctly in final writing products."

Smaller class size. Class size makes a difference in early reading performance. Studies comparing class sizes of approximately fifteen to those of around twenty-five in the early elementary grades reveal that class size has a significant impact on reading achievement, especially if teachers are also using more effective instructional strategies. Reductions of this magnitude are expensive, of course, if used all day. A more practical alternative is to reduce class size just during the time set aside for reading, either by providing additional reading teachers during reading periods or by having certified teachers who have other functions most of the day (e.g., tutors, librarians, or special education teachers) teach a reading class during a common reading period.

Curriculum-based assessment. In first grade and beyond, regular curriculum-based assessments are needed to guide decisions about such things as grouping, the pace of instruction, and individual needs for assistance (such as tutoring). The purpose of curriculum-based assessment is to determine how children are doing in the particular curriculum being used in the classroom or school, not to indicate how children are doing on national norms. In first grade, assessments should focus on all of the major components of early reading: decoding of phonetically regular words, recognition of sight words, comprehension, writing, and so on. Informal assessments can be conducted every day. Anything children do in class gives information to the teacher that can be used to adjust instruction for individuals or for the entire class. Regular schoolwide assessments based on students' current reading groups can be given every six to ten weeks. These might combine material read to children, material to which children respond on their own, and material the child reads to the teacher individually. These school assessments should be aligned as much as possible with any district or state assessments students will have to take.

Effective grouping strategies. Children enter first grade at very different points in their reading development. Some already read while others lack even the most basic knowledge of letters and sounds. Recognizing this, schools have long used a variety of methods to group children for instruction appropriate to their needs. Each method has its own advantages and disadvantages.

The most common method is to divide children within their own class into three or more reading groups, which take turns working with the teacher. The main problem with this strategy is that it requires "follow-up time" activities children can do on their own while the teacher is working with another group. Studies of follow-up time find that, all too often, it translates to "busywork." Follow-up time spent in partner reading, writing, working with a well-trained paraprofessional, or other activities closely linked to instructional objectives may be beneficial, but teachers must carefully review workbook, computer, or other activities to be sure they are productive.

Another strategy is grouping within the same grade. For example, during reading time there might be a high, middle, and low second-grade group. The problem with this type of grouping is that it creates a low group with few positive models.

Alternatively, children in all grades can be grouped in reading according to their reading level and without regard to age. A second-grade-level reading class might include some first graders, many second graders, and a few third graders. An advantage of this approach is that it mostly eliminates the "low group" problem and gives each teacher one reading group. The risk is that some older

children will be embarrassed by being grouped with children from a lower grade level. Classroom management and organization for reading instruction are areas that deserve further research and attention.

Some other things that will help teachers to teach reading effectively include:

Tutoring support. Most children can learn to read by the end of first grade with good-quality reading instruction alone. In every school, however, there are children who need more assistance. Small-group remedial methods, such as those typical of Title I or special education resource room programs, have not generally been found to be effective in increasing the achievement of these children. One-to-one tutoring, closely aligned with classroom instruction, has been effective for struggling first graders. While it is often best to have certified teachers working with children with the most serious difficulties, well-trained paraprofessionals can develop a valuable expertise for working with these children. Trained volunteers who are placed in well-structured, well-supervised programs also can be a valuable resource.

Home reading. Children should be spending more time on reading than is available at school. They should read at home on a regular basis, usually twenty to thirty minutes each evening. Parents can be asked to send in signed forms indicating that children have done their home reading. Many teachers ask that children read aloud with their parents, siblings, or others in first grade and then read silently thereafter. The books they read should be of interest to them and should match their reading proficiency.

C. SECOND GRADE AND BEYOND

Children who are not decoding and comprehending well at the end of first grade need immediate special attention.

By the end of first grade, with high-quality instruction and any necessary tutoring or other assistance, most students should, in fact, be able to decode virtually any phonetically regular short word with short or long vowels and read a large number of high-frequency sight words. If children have developed good decoding skills in first grade, further instruction in phonics is needed, but limited.

By the time they enter second grade, children also need to have solid comprehension skills, both for understanding material they read on their own and for material that is read to them. They need to be able to understand a beginning second-grade text they haven't seen before, and they need to learn to monitor their own comprehension for confusion and uncertainty.

As they progress through second grade and beyond, children need to develop a real joy of reading and to read a wide variety of materials, expository (nonfiction) as well as narrative. Through such reading, children will develop greater fluency, vocabulary, background knowledge, comprehension strategies, and writing skills.

Instruction needs to be concentrated on:

Literature. At this point, children should read quality literature appropriate to their current reading levels, both in school and at home. Basal programs, student readers, novels, anthologies, and other sources of good reading material can all be used. The goal increasingly becomes for children to develop a real joy of reading that propels them to read frequently and widely.

Expository text (content knowledge). In most schools, reading instruction has traditionally focused overwhelmingly on narratives. Yet children also need strong comprehension strategies for science, history, geography, and other content areas. These are important in their own right, of course, but take on additional importance in reading development. Research finds that one of the best predictors of reading comprehension is background knowledge. Obviously, it is much easier to comprehend narrative text such as the *Diary of Anne Frank* if you know about the Holocaust, or to comprehend *To Kill a Mockingbird* or *Sounder* if you know about the history of the American South. It makes sense both to infuse expository material into reading instruction and to teach effective reading comprehension strategies and study skills during social studies and science periods.

Reading comprehension. Everything teachers do in reading class and beyond should be designed to build children's ability to understand increasingly complex content of all sorts. Children need to learn reading

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strategies known to enhance comprehension and retention. For example, children can learn to scan material before they read, to predict what will happen in the story, and to recall background knowledge about the topic discussed in the material. While reading, they can learn to look for characters, settings, problems, and problem solutions, to summarize main ideas, and to monitor their own understanding (for example, regularly asking themselves whether they understand what they are reading). After reading, children can be taught to make charts, webs, outlines, and other representations of the content. They can generate questions for other children, or write their own reactions to stories or factual material. They can summarize or retell stories to partners or to the teacher. They can be taught generic reading comprehension strategies such as finding the main idea, starting with simple paragraphs and moving to more complex material. All of these strategies help build reading comprehension skills that will work with any reading material, not just the particular stories or content children are reading.

Vocabulary. Children's vocabulary can be built by teaching specific words that appear in students' texts, giving students opportunities to use these words in a variety of contexts, and teaching students dictionary skills. We want students paying attention to and liking words. While research shows some benefit of direct instruction on vocabulary development, it also finds that vocabulary growth is heavily influenced by the amount and variety of material children read. Nevertheless, the power of home and school reading for vocabulary building are strongly influenced by the support and encouragement that students are given for attending to and learning about new words as they read. A good practice, for example, is to ask students to note three new words of their own choice in the course of their reading and then to set aside some time to collect, discuss, and revisit such words, extending and clarifying their usage and meanings. In addition, vocabulary will be boosted as children become fluent in using and understanding multi-syllabic patterns.

Writing. Research on creative writing finds positive effects of writing process models in which students work in small groups to collaboratively plan, draft, revise, edit, and publish individual compositions in various genres. Specific instruction in writing for different audiences and purposes (such as persuasive argument, description, and giving directions), as well as instruction in strategies that enrich and clarify language expression, is essential. Language mechanics skills, such as capitalization, usage, and grammar, can be directly taught and integrated into students' own writing through the editing process. For example, students might study proper use of adjectives and adverbs and then write descriptive compositions. An editing checklist would add "correct use of adjectives and adverbs" as a criterion for review in a peer-editing process.

Cooperative learning. Cooperative learning can be very effective in upper elementary reading and writing instruction if it is properly used. In general, students should work in groups of 4 to 5 members that stay together over a period of 6 to 8 weeks. The groups should be able to earn certificates or other recognition based on the degree to which all of their members have mastered the material being presented in class. For example, the teacher might present a lesson on main idea, and then let students work in groups to practice that skill. Groups should be set up to help all members master material, not to make it possible for any child to do his or her group's work. At the end of the period, the children might be individually assessed on main idea, and the group could receive recognition based on the total score of the members' quizzes.

Strategies for Achieving the Goal of Every Child Reading

If 40 percent of all third graders are not reading adequately today, reducing this substantially by the time children being born today reach third grade will be an enormous undertaking. Different kinds of strategies will be necessary to improve the performance of children in general, of those with mild reading difficulties, of those with serious reading difficulties, and of those who are dyslexic. There is a great deal we can do now on all of these fronts, including:

1. Base educational decisions on evidence, not ideology. It is time to call off

the endless "reading wars." As the review of research presented earlier clearly demonstrates, there is validity to methods derived from many different philosophical bases. Some areas of emerging consensus include:

- All children need explicit, systematic instruction in phonics and exposure to rich literature, both fiction and nonfiction.
- While children need instruction in phonics in early reading development, even then, attention to meaning, comprehension strategies, language development, and writing is essential.
- At all times, developing children's interest and pleasure in reading must be as much a focus as developing their reading skills.

The famous pendulum of educational innovation swings more wildly in reading than in any other subject. Pendulum swings of this kind are characteristic of fields driven by fashions, not by evidence. Hemlines go up and down because of changing tastes, not new evidence; progress in medicine, engineering, and agriculture, based to a far greater degree on evidence from rigorous research, is both faster and less subject to radical shifts. In the same way, educational practice must come to be based on evidence—not ideology.

While there is always more we'd like to know, we do know enough now to take action that will greatly reduce the number of children who cannot read and greatly increase the number who can reach high levels of achievement. We cannot wait for research to answer every question while another generation of children falls behind.

2. Promote adoption of texts based on the evidence of what works. Historically, reading textbooks have been adopted primarily based on criteria that have little to do with evidence: attractiveness, cost, supplements, and so on. This must change. There is little evidence about the effectiveness of particular textbooks, but there is enough evidence to recommend certain types of approaches, such as the use of texts with a high proportion of words that can be sounded out in first grade.

3. Provide adequate professional development. Better books will not in themselves lead to better readers. Teachers and paraprofessionals must receive quality staff development on instructional strategies. This means far more than the brief inservice presentations traditionally provided by textbook publishers. Effective professional development requires extended time for initial inservice that includes discussions of research on how children learn to read as well as specific instructional strategies. In addition, it requires extensive in-class follow-up. Expert coaches (who may be fellow teachers) need to visit the classes of teachers who are implementing new reading approaches and then need to have time to discuss strengths and next steps with the teachers. Teachers and paraprofessionals need to have opportunities to meet regularly to discuss their implementation of new methods—and to share problems, solutions, and innovative ideas. Professional development needs to be seen as a never-ending process that involves the entire school staff, not a one-time event.

4. Promote whole-school adoption of effective methods. Some of the most effective approaches to early literacy instruction are comprehensive methods that provide instructional materials, assessments, extensive professional development, accommodations (such as tutoring) for children who are having difficulties, designs for classroom and school organization, and other features. These methods are adopted by the entire school, providing a common focus and extensive assistance in implementing a well-integrated design for change.

5. Involve parents in support of their children's reading. Research shows that parent involvement, especially in activities that directly support their children's school success, is correlated with reading achievement. Parents can do a great deal to build their children's literacy development. They can read to children from infancy through the elementary grades. They can monitor their children's home reading and ask teachers to require regular reading as homework. They can take children to the library and borrow or purchase books.

Teachers should take special efforts to open communication with parents, encouraging them to take an active interest in their children's schoolwork and progress. Many parents feel uncomfortable without such an invitation and guidance. Teachers can provide parents with special strategies to increase the value of home reading, such as

At all times, developing children's interest and pleasure in reading must be as much a focus as developing their reading skills.

talking to children about characters and plots, and asking them to make predictions or summarize stories. Parents can serve as volunteer listeners or tutors in the school. Perhaps most importantly, parents can communicate a love of reading, pleasure in children's reading progress, and support for the school's efforts to ensure the literacy of all children. In addition, they can advocate within the school and beyond for use of effective instructional methods for all.

6. Improve preservice education and instruction. Reading instruction would be improved if all teachers had instruction on the research base about learning to read, instruction on applications of that research in the classroom, and experience with such methods during their preservice education and early years of teaching. Preservice education typically gives teachers too little instruction in reading methods and is often discrepant with research on effective methods. Also, prospective teachers rarely get opportunities to practice reading methods before their student teaching experience. Schools of education need to improve their programs for elementary teachers substantially and to give prospective teachers experiences, such as tutoring in local schools or working in summer school or afterschool programs, that will give them better preparation in this most critical of skills. School districts should also invest in high-quality induction programs to make certain that new teachers are well prepared in effective approaches to reading, classroom management, assessment, and so on and are well supported in implementing these strategies.

7. Provide additional staff for tutoring and class-size reduction. Schools need additional staff to ensure adequate reading performance by all children. These staff are needed for two purposes. First, they are needed as tutors for children who are struggling in reading in the early grades. Second, they are needed to reduce class sizes in reading. The same teachers can be used for both of these purposes; for example, a certified teacher can provide tutoring sessions to at-risk children most of the day but also teach a reading class during a common schoolwide reading period, thereby reducing class size for reading. Class sizes can also be reduced for reading by providing training to librarians, special education teachers, and other certified teachers willing and able to teach reading, or by hiring retired teachers or other part-time teachers for the same purpose.

Paraprofessionals can also be used to provide one-to-one tutoring to struggling students. Such tutoring requires extensive training, follow-up, and supervision and should supplement, not replace, tutoring by certified teachers for children with the most serious reading difficulties.

For students without serious reading difficulties, volunteers, if trained and supervised to provide assistance consistent with the school's reading program, may also be effective tutors, especially to provide students with extended supported time for reading.

8. Improve early identification and intervention. Diagnostic assessments should be administered regularly to kindergartners and first graders. Moreover, both time and instruments should be available for individual assessment as needed. Such tools can tell us which children are having reading difficulties and enable teachers to provide immediate and high-quality interventions if necessary.

9. Introduce accountability measures for the early grades. In recent years, many states have implemented assessment and accountability schemes that hold schools accountable for the performance of children in selected grades. Usually, the earliest assessments are of third or fourth graders. If younger children are assessed for accountability purposes, it is almost always on group-administered standardized tests that have little validity for young readers.

The problem with these strategies is that they have unintentionally created disincentives to focus on the quality of early grades instruction. A school that adds prekindergarten or full-day kindergarten programs or invests in professional development for beginning reading or adds tutors or reduces class sizes in the early grades may not see any benefit of these investments in terms of third- or fourth-grade test scores for several years.

One solution to this problem would be to introduce individually administered reading measures at the end of first or second grade. These might be given by specially trained

teachers from other schools (such as Title I teachers or other teachers without homerooms). Such measures could be used for accountability assessments in combination with the results from other assessments in the elementary grades. But extraordinary care must be taken to assure that pressure—on students or staff—to do well on these assessments does not translate into the use of inappropriate tests or instructional time lost to test preparation.

10. Intensify reading research. If early reading were as high a priority in our society as, say, space exploration was in the 1960s, there is little question that early reading failure could be virtually eliminated. A large and broadly focused program of research, development, and evaluation could resolve early reading problems within 5 or 10 years; at present, there is no effort of this size or scope on the horizon.

We need to learn more about:

- identifying the most effective reading approaches, programs, methods of school and classroom organization, and intensive professional development approaches;
- developing strategies for the children who do not succeed, even with high-quality instruction and tutoring;
- choosing forms of tutoring that make best use of this expensive resource;
- promoting effective strategies for prekindergarten and kindergarten;
- determining the proper balance between phonics and meaning. (For example, it would be useful to learn the best mix between decodable and sight words in early first-grade reading materials, and it would be useful to know precisely how long and how intensively children need instruction in phonics.);
- helping children who are now in the upper elementary and secondary grades who have inadequate reading skills;
- developing and evaluating better strategies for children who speak languages other than English, whether they are taught in English or in their home language;
- using technology for beginning reading, for upper-elementary reading, for writing, and for remediation; and
- building effective extended-day and summer programs. □

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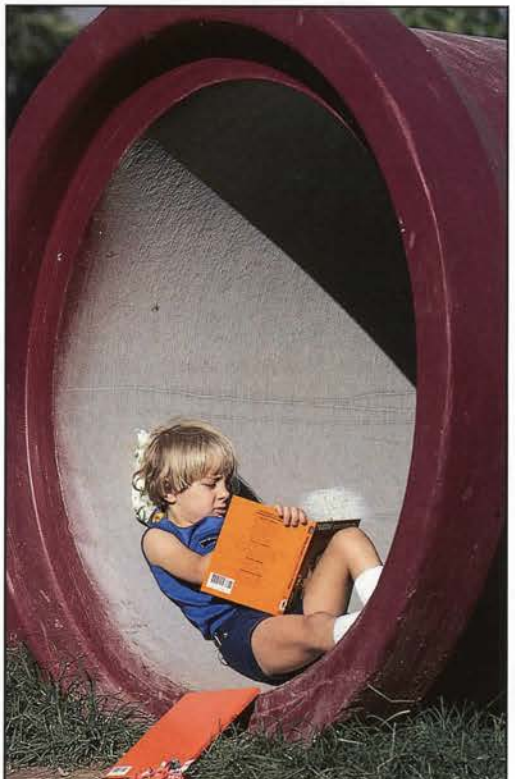
If early reading were as high a priority in our society as, say, space exploration was in the 1960s, there is little question that early reading failure could be virtually eliminated.

Page opposite, U.S. Air Force Lt. Brennan Peterson from Austin, Texas, reads a magazine as he sits on the wing of his C-21 jet waiting for flight instructions at a base in Saudia Arabia, November 19, 1990: Reuters / Corbis-Bettmann; above, New York City subway, 1950: Corbis-Bettmann; at left, photo by Michael Newman / Photo Edit / PNI; at right, © Al Messerschmidt / FOLIO, Inc.



GETTING AT THE MEANING

How To Help Students Unpack Difficult Text

BY ISABEL L. BECK, MARGARET G. MCKEOWN, REBECCA L. HAMILTON, AND LINDA KUCAN

A STUDY THAT we conducted in 1991 on students' history learning included interviewing eighth graders as they finished their study of early American history. A question about what happened in the Revolutionary War prompted the following response from Jennifer, one of the students:

> I don't really remember this too well; I don't know why. We always learn about this and I always forget. It's so important too. Something like one of the colonies was too strong and something happened and they got into a war over it, and it was going on for a while and that's just one of the things. I don't know why I don't remember this. It's pretty embarrassing. (Beck & McKeown, 1994)

How many teachers have heard or expressed a sentiment that reflects Jennifer's confusion: "I've spent all week teaching this chapter and the students just aren't getting it"? That students do not "get it" is a common concern among educators. Despite the best efforts of teachers and the seeming attentiveness of students, students often fail to understand the ideas presented in their textbooks. In particular, students often are unable to connect the ideas they have encountered to information that is presented later. As one teacher expressed with frustration, "Sometimes the kids learn something; they even seem to know it for the test, and then, a month later, it's like they've never even heard of it!"

P. David Pearson, a reading researcher and the former Dean of the College of Education at the University of Illinois, recently described his encounter with this problem (Pearson, 1996):

> ...when I ask teachers about their most serious concerns in literacy instruction, they invariably say—and this is especially true if they teach fourth grade or higher—'Well, if you think my kids have trouble with stories, you should come and see what we do with our social studies and science class. That's where the real trouble begins.'
>
> ...If you look in middle school and high school classrooms to examine the role of expository text, you are virtually forced to conclude that it has none. Occasionally teachers assign expository texts for homework, but when students come to class the next day, clearly having avoided the assignment, teachers provide them with an oral version of what they would have gotten out of the text if they had bothered to read it. Most high school teachers have quite literally given up on the textbook for the communication of any important content. While understandable, this approach is, of course, ultimately counterproductive. There comes a time in the lives of students —either when they go to college or enter the world of work—when others expect them to read and understand informational text.

The concern about reading comprehension—particularly comprehension of expository, informational text—is clearly widespread. Students are simply not garnering much meaning from much of the expository text they confront. Why? Part of the answer, of course, is that the texts are often not well written. They assume background information that the students do not have; they give inadequate explanations of the information they present; they fail to show the connections from a cause to an event and from an event to a consequence; and so on.

Earlier in our research, we confronted this problem head on. That is, we examined the extent to which more coherent text presentations would facilitate students' understanding. We revised textbook passages, establishing textual coherence by clarifying, elaborating, explaining, and motivating important information and by making relationships explicit. To some extent, it worked. When the revised passages were presented to the students, they recalled significantly more of the text and answered more questions correctly (Beck, McKeown, Sinatra, & Loxterman, 1991).

But even if we could count on all expository texts being as student-friendly as the revised versions we worked so hard on—and we clearly *can't* count on that happening—it wouldn't be sufficient.

Isabel L. Beck is a professor of education and senior scientist at the Learning Research and Development Center at the University of Pittsburgh. Margaret G. McKeown is a research scientist at the same Center. Rebecca L. Hamilton is a special projects coordinator for the Pittsburgh Public Schools. Linda Kucan is an assistant professor of education at Bethany College in Bethany, West Virginia.

Despite the advantages shown for readers of the revised passages, the results of our study indicated that readers still had considerable difficulty understanding the texts. The recalls of many students pointed to surface-level treatments of text information. Reading the recalls gave us the impression that students took what they could get in one swift pass through the words on a page, and then formed that into a shallow representation of the text. This kind of cursory use of the text suggests that students resist digging in and grappling with unfamiliar or difficult content.

At this point, our research interests shifted to exploring ways to get readers to engage with texts and to consider ideas deeply. Over time, this led us to develop an approach we call Questioning the Author (QtA), which is designed to get students to build understanding of text ideas by becoming actively involved as they read, by diving into difficult information and grappling to make sense of it.

QtA is an approach that can be used equally well with either expository or narrative (fictional) texts. In this article, we will draw our examples from expository texts only—the genre of content area textbooks—because many teachers feel this is the harder nut to crack, the place where students are most likely to glaze over, disconnecting themselves from any chance for meaningful learning.

BUILDING UNDERSTANDING is not a new idea, but the way understanding is built distinguishes Questioning the Author from other approaches. Ideas in a text are cumulative, so in order to build meaning along the way, text is dealt with "on-line," as ideas are initially encountered, rather than waiting until after reading has been completed.

In QtA, we teach students that readers must try to "take on" a text little by little, idea by idea, and try to understand while they are reading what ideas are there and how they might connect or relate those ideas. To understand this approach, consider what is often done in classrooms when teaching from a text. It is typical practice to assign material to be read and then to pose questions to evaluate student comprehension. This read-question-evaluate pattern is an "after-the-fact" procedure. There are two problems with this approach. First, students may have questions as they read or may simply finish a text knowing only that they are lost but are not sure why. The questions posed by the teacher only serve to expose their embarrassment over their lack of understanding. Also, there is no way for teachers to know if some students have constructed misconceptions about the passage and think they have understood. Second, even though students hear right answers, they may never understand what makes them right.

In QtA, however, the goal is to assist students in their efforts to understand as they are reading for the first time. Not only is this orientation a better reflection of how a reader needs to address text content to build understanding, but it is also an opportunity for valuable teaching and learning experiences. First, it gives teachers repeated opportunities to facilitate student efforts as they are trying to understand what they are reading. Teachers can model confusion, identify problematic language and difficult ideas in text, and ask *Queries* that focus student thinking. All these actions can serve as comprehension strategies that students ultimately learn and use on their own. Second, grappling with ideas during reading gives students the opportunity to hear from one another, to question and consider alternative possibilities, and to test their own ideas in a safe environment. Everyone is grappling, everyone is engaged in constructing meaning, and everyone understands that the author, not the teacher, has presented them with this challenge. The chance for cumulative misconceptions diminishes, and the opportunity for meaningful discussion increases.

Constructing meaning during reading means going back and forth between reading relatively small segments of text and discussing the ideas encountered. This back and forth process requires decisions about where to stop reading a text and to begin discussion of ideas. It is the task of a teacher using the QtA approach to prepare for this construction of meaning by analyzing and identifying the important concepts of a text and making decisions about how much of the text needs to be read at once and why. Making decisions about how much text to read is referred to as *segment-*

ing text, that is, identifying starting and stopping points. Decisions about segmenting the text are made based on the text content and the ideas and information presented, not on the length of a page or the point at which a page or paragraph ends.

QUESTIONING THE Author incorporates three major strategies. The first is what we call *Queries*, which are the probes used to prompt discussion. The second strategy consists of discussion "moves," such as modeling, revoicing, and annotating, which are necessary if discussion is to become a real vehicle for grappling with ideas and building understanding. The third component of QtA is the careful teacher planning required to make *Queries* and discussion effective tools for digging into meaning. It is beyond the scope of this article to elaborate all that's involved in these three strategies. Rather, we will focus on *Queries,* the engine that drives QtA.

How *Queries* Differ from Some Traditional Questions

We begin by considering what *Queries* are and what appears to differentiate them from some traditional questions. The major points of comparison are summarized in Table 1. One difference between questions and *Queries* is that some questions are used to assess student comprehension of text information after reading. In contrast, *Queries* are designed to assist students in grappling with text ideas as they construct meaning.

Table 1
Characteristics of Some Traditional Questions and QtA *Queries*

Questions	*Queries*
1. assess student comprehension of text information after reading	1. assist students in grappling with text ideas to construct meaning
2. evaluate individual student responses to teacher's questions and prompt teacher-to-student interactions	2. facilitate group discussion about an author's ideas and prompt student-to-student interactions
3. are used before or after reading	3. are used during initial reading

Earlier, we referred to a typical pattern of instruction in which students read a passage, the teacher initiates a series of questions, students respond, and the teacher evaluates their responses. This pattern, which has been documented as a prevalent teaching practice, is referred to as the IRE pattern of instruction: Initiate, Respond, and Evaluate (Dillon, 1988; Mehan, 1979). The IRE pattern *assesses* comprehension; it does not *assist* the process of comprehending. Moreover, the IRE pattern of asking questions after the reading is completed tends to involve questions that are more effective in encouraging students to recall what they have read rather than in supporting students as they build an understanding of what they are reading.

Queries, in contrast, are less focused on assessing and evaluating student responses than on supporting students as they dig in to make sense of what they are reading. *Queries* focus attention on the quality and depth of the meaning that students are constructing rather than on the accuracy of the responses they give. As indicated in Table 1, another difference between questions and *Queries* is that the purpose of some traditional questions seems to be to evaluate individual student responses and to prompt teacher-to-student interactions. In contrast, *Queries* aim to facilitate group discussion about an author's ideas and tend to prompt student-to-student interactions.

Questions are often useful in giving teachers a quick idea of which students are comprehending text and which are not. However, what also tends to happen is that, although a question is directed to the entire class, only one student provides the answer. This individual assumes all the responsibility and releases the other students from any share in it. The action takes place between the teacher and one student, and the rest of the class is not involved. Students tend to compete for the chance to say the right answer, and the teacher lets students know when their answers are correct.

Queries, on the other hand, are designed to change the role of the teacher to a facilitator of discussion. A teacher who uses *Queries* evaluates student responses less often and focuses more on encouraging students to consider an author's ideas and to respond to one another's interpretations of those ideas. As a result, student-to-student and student-to-teacher interactions tend to increase, and the context for learning is a classroom of spirited learners grappling with an author's text and working together to understand it.

Our last point, as noted in the table, is that questions typically are used before or after reading. In contrast, *Queries* are used continually during the initial reading of a text. When teachers ask questions after reading, students may get messages that teachers may not intend. For example, students may assume that questioning is a different and perhaps unrelated exercise from reading. Right and wrong is the focus of attention for both teacher as evaluator and student as evaluatee. Are these the messages we want to convey to students? A more correct message is that readers are always questioning as they read. Questioning and reading are symbiotically related, enhancing each other in mutually beneficial ways.

When teachers use *Queries*, students are more likely to get the message that reading and trying to determine the author's intended meaning are aspects of the same process. The thinking elicited by *Queries* is part of the reading experience, not something that is separate from that experience. *Queries* supplement the text, helping students deal with what is there as well as with what is not there. The focus of *Queries* is on building understanding, not on checking understanding.

Comparing the Effects of Questions and *Queries*

To provide a better sense of the nature of *Queries*, what they are, what they accomplish, and how they differ from some traditional questions, we will consider an example of a question-driven lesson and an example of a *Query*-driven lesson. The first example is

based on an excerpt from a social studies textbook about early Polynesians that was used in a fourth-grade class. We will look at a transcript of the lesson as it unfolded with the teacher's traditional questions driving the discussion. In the second example, we will show how the same text excerpt was handled one year later by the same teacher after she had learned about QtA and how *Queries* can be used to direct discussion. Finally, we will consider the difference in what students seem to understand as a result of a *Query*-driven lesson in contrast to a question-driven lesson.

Here is the excerpt about early Polynesians from a social studies textbook (Laidlaw, 1985, p. 148):

> When the Polynesians settled on the Hawaiian Islands, they began to raise plants that they had brought with them. One kind of plant that the Polynesians raised was the taro plant. This is a kind of plant raised in warm, wet lands, mostly for its roots. The early Hawaiians cooked the roots, and then they generally pounded them on a board to make a paste called poi. This was a favorite food of the early Hawaiians. Sweet potatoes, bananas, breadfruit, and coconuts were some of the other plants that the early Hawaiians raised for food. Animals raised by the early Hawaiians for food were chickens, pigs, and dogs.

In the first example, to start the lesson, the teacher asks the question, "What did the early Hawaiians eat?" As indicated below, the students answer by naming things they read in the text, and the teacher repeats what each student says, sometimes interjecting other questions.

RANIA: Sweet potatoes.
TEACHER: Sweet potatoes. Excellent. Brent?
BRENT: Breadfruit.
TEACHER: Breadfruit. What is breadfruit? What is it? Is it bread? No, what is it? Carmen?
CARMEN: A tree that has fruit.
TEACHER: Yes. It's a tree that has a fruit. And when you cook the fruit, it looks like...
JIM: Bread.
TEACHER: Bread. That's why we call it breadfruit, isn't it? And it has no seeds. Excellent. Good readers. Nakisha?
NAKISHA: Coconut.
TEACHER: Coconuts. Beth?
BETH: Bananas.
TEACHER: Bananas. John?
JOHN: Chicken.
TEACHER: Chicken.
NICOLE: Pigs.
TEACHER: OK.

As the lesson proceeds, the students offer more examples of foods eaten by the early Polynesians, such as seaweed and roots. Then, the teacher asks questions that lead students to describe poi, the Hawaiians' favorite food, again through single-word responses, breaking the pattern only to elicit more information:

JIM: Seaweed.
TEACHER: Seaweed. Kelvin?
KELVIN: Roots.
TEACHER: Roots? What do you call those roots?
KELVIN: Uh. Poi.
TEACHER: OK. What did we call the roots?
JIM: Taro.
TEACHER: Good. Now, what did they make out of taro?
JIM: Poi.
TEACHER: Poi. What's the Hawaiians' favorite food?
JIM: Poi.
TEACHER: And what does it look like? How can we describe it? What's the poi look like, Nakisha?
NAKISHA: Like paste.
TEACHER: Paste. It doesn't taste like paste, goodness no, but it looks like paste. It has the same consistency, and it is called poi, and that was their favorite food. Did we miss anything. Nicole?
Nicole: Seafood.
Teacher: Seafood. I think we have it all. John?
John: They said they ate a kind of seaweed.

After naming all the foods, it is not clear if the students have any understanding of what this information means or how it connects to an important idea. Additionally, the tone of this lesson is dull and uneventful. There is a kind of monotonous pendulum-like effect, with the teacher and students echoing one another in one-word exchanges.

Now, we will look at how the same text excerpt was handled a year later by the same teacher, using *Queries* instead of questions to drive the lesson. Recall that the first time the teacher taught this lesson, she had the students read the entire text excerpt and then answer her questions. One year later, the lesson begins as follows, after the class had read just the first sentence of the text excerpt: "When the Polynesians settled on the Hawaiian Islands, they began to raise plants that they had brought with them." Then the teacher begins the discussion as follows:

TEACHER: What does the author mean by just this one sentence?
ANTONIO: He means that they brought some of the food that they had there with them.

Antonio's response misses a key point that is essential to understanding the message of the paragraph: The Polynesians brought certain foods with them that they then began to raise in their new environment. The teacher's next *Query* emphasizes this point and leads to an important exchange with Temika:

TEACHER: Um-hmm, we decided that yesterday. But what does the author mean by they began to *raise* the plants they brought with them. Temika?
TEMIKA: Like the plants and stuff, they began to plant them.
TEACHER: They began to plant them, why?
TEMIKA: For their food!
TEACHER: Right! They can plant the things that they brought, then they're going to have their own crops in Hawaii. OK, good.

When the important concept about raising crops is brought out, notice how the QtA orientation of digging into text information produces a question from a student:

ALVIS: Why do they need to plant things when they already brought things over?

Alvis realizes that he does not understand the significance of the author's point. Notice that rather than an-

swering the student herself, the teacher returns the responsibility for thinking and grappling with the issues to the students:

TEACHER: Who can answer Alvis's question? He said, they already had food, why did they have to plant the food? Roberta?

ROBERTA: Maybe because, like back then in the Hawaiian Islands ... probably, you couldn't drive to the store, like they do now.

TEACHER: OK, so Roberta's saying they couldn't get in their car and drive to the stores, but Alvis still has a point. Why not just eat the food they brought?

ALVIS: They could run out.

TEACHER: Oh, I think you just answered your own question. Alvis, say what you just said.

ALVIS: 'cause they'll run out of food.

Turning back the question to students gives them a chance to rediscover the idea that food eventually runs out and that to survive the Hawaiians needed to plant their own crops. Roberta's explanation helps Alvis realize that the food may have run out. Once the issue has been resolved, the teacher is ready to continue. This segment of the lesson transcript suggests that the combination of deliberate segmenting of text based on the ideas in the text and a sequence of carefully developed *Queries* make it possible for students to grapple with important ideas.

To capture some of the important differences between the two lessons about early Polynesians, a summary of some characteristics of the question-driven and the *Query*-driven discussions is presented in Table 2. First, the *Query*-driven discussion seemed to change student responses. In the question-driven discussion, students tended to respond in short, one-word answers, and they frequently used the author's language. In the *Query*-driven discussion, the students gave longer, more elaborate answers that reflected original thought and analysis expressed in the students' own language.

Second, the text orientation of the *Query*-driven discussion was different from the question-driven discussion. Students tended to use a text in the question-driven discussion as a resource for retrieving information, a place to check the facts against their own memories. The text was little more than a source for finding correct answers. In contrast, in the *Query*-driven discussion, the text seemed to take on a different role. It seemed to become a working reference for connecting ideas and analyzing an author's style and motivation. The text became an ally in constructing meaning.

Table 2
A Comparison of Question-Driven and *Query*-Driven Discussions about Early Polynesians

Question-Driven Discussions	*Query*-Driven Discussions
Student Responses	
■ one-word answers	■ longer, more elaborate answers
■ in author's language	■ in student's language
Text Orientation	
■ resource for retrieving information	■ reference for connecting ideas
■ source for finding correct answers	■ ally in constructing meaning
Discussion Dynamics	
■ teacher-to-student interactions	■ student-to-student interactions
■ dull pace: little student engagement	■ exciting pace: student engagement
■ product oriented	■ process oriented
■ all questions teacher initiated	■ some questions student initiated

Third, there were differences in the dynamics of the question-driven and the *Query*-driven discussions. Questions tend to promote teacher-to-student interactions with few opportunities for students to respond to one another or debate issues. As a result, question-driven lessons had a dull pace with little student engagement. The question-driven discussion was product oriented, and the product was what students remembered or what they could find in the text.

In contrast, the *Query*-driven discussion tended to promote student-to-student interactions as well as student-to-teacher exchanges, a more natural context for considering ideas. The *Query*-driven discussion seemed to have an exciting pace, with evidence of student engagement. In addition, the *Query*-driven discussion was process oriented. The goal was not focused completely on getting the right answer; rather, the goal was to get involved in the process of approaching a text in ways that encourage deep thinking.

Finally, in the question-driven discussion, almost all questions were teacher initiated. In the *Query*-driven discussion, at least some questions were student initiated.

Let's look at another text example. The following lesson transcript is from a social studies lesson about life in Siberia. The teacher begins by expressing concern about some sentences from the text and rereading those sentences:

TEACHER: Hold on. I'm concerned about these sentences: "During the summer months these people spent time preparing reindeer meat. They also made cheese from reindeer milk. These foods were then stored for the long winter months." What's the author trying to tell us here? "These foods were then stored for the long winter months." Charles?

Students begin to respond, focusing mainly on it being too cold in Siberia to gather food in the winter. The teacher persists in trying to get the students to go beyond the words in the text and reach for greater meaning:

CHARLES: They, they had to gather up food because they um, because they'd need food for the winter since it's so cold.

TEACHER: Oh, OK. Charles said 'cause it's so cold. I'm still a little confused. What do you think, Antonio?

ANTONIO: I think that the author thinks that during the summer months they had to go out and be gathering up the food 'cause it's not as cold but it's still cold. And then when it's winter, they don't have to worry about uh, trying to get their food.

TEACHER: I think we're all agreeing that in the wintertime, they're not gonna get anything to eat, but I'm not sure I understand why. What do you think, Alvis?

ALVIS: I think, I think they do it in the summer because in the winter it's too hard to find all the food, because there's a lot of snow. And the trees and the plants and everything are dead because it's too cold.

TAMMY: I think that they store all their food because the animals like, go away for the winter. They can't find animals to kill because it's too cold.

BETTY: I think that they do it in the summer because, I agree with Tammy, 'cause it's warmer so they can find animals.

The teacher then recaps the ideas students have suggested and points out that they—not the author—came up with the ideas:

TEACHER: Those are really good ideas. The author just told us, "These foods were then stored for the long winter months." But did he tell us why?

STUDENTS: No.

TEACHER: No. And Tammy thinks it's 'cause the reindeer kind of hibernate. Is that what you mean? And Alvis and Betty said it's because it's too cold for the hunters to hunt. And you know what? I don't really know the answer. But I think you have some good ideas that might possibly be why. And it's important that you were able to come up with those ideas.

Gradually, as the contributions of Antonio, Alvis, Tammy, and Betty are combined with the teacher's summarizing, the students build the understanding that climate affects behavior and motivates action, and that the author did not express this idea very clearly. We do not believe that these understandings would have been as likely to be constructed without the *Initiating Query* that began the discussion.

To summarize, we observed three specific effects of the *Initiating Query* in the "life in Siberia" lesson. First, students did the work of constructing meaning. The teacher asked students to do the thinking and started a discussion and set things in motion with a clear goal in mind. She guided the students to a realization about the text, but she did not tell them what the realization was.

Second, students discovered the difference between knowing what an author says and knowing what an author means. They also helped one another get the job done; they needed to combine ideas, and with prompting and encouragement, they dug into the text more than once to unravel the meaning.

Finally, the tone of the interactions was positive; there was evidence of engagement and personal investment in ideas and thought. The students were learning, and they were enjoying the activity.

Now, let's analyze one final example of how Questioning the Author can help students build meaning. This example is from a discussion about these two sentences in a social studies text (Laidlaw, 1985, p. 87): "There is no sunlight during most of the winter months in Antarctica. However, during the summer months, the sun shines twenty-four hours a day." The teacher begins with an *Initiating Query* that draws a response that does not address the issue represented by the text:

TEACHER: What's the author trying to tell us here?

ALETHA: The earth keeps on going around, keep on going around 24 hours a day.

The teacher then poses a *Follow-up Query* that directly addresses the difficulty: The author is presenting information that conflicts with what the students already understand about night and day.

TEACHER: Aletha says the earth keeps going around, twenty-four hours a day. So right now on one side of the earth it's daylight, and over here it's dark (pointing on a globe). So what does the author mean when he says there's no sunlight during most of the winter, and the sun shines twenty-four hours a day in the summer?

DARLEEN: Um, I think it's like, um, every time it goes around from the light to dark, every time it goes around it changes from light to dark, every twenty-four hours.

Darleen's response misses the point, so the teacher presses with another *Follow-up Query*. The *Query* urges students to put the pieces of information together, which the next student called on begins to do very nicely:

TEACHER: Well, I think Darleen's saying the same thing that a lot of you are saying, that the globe is turning around and when it's light on this side, it's dark over here. Does that make

(Continued on page 85)

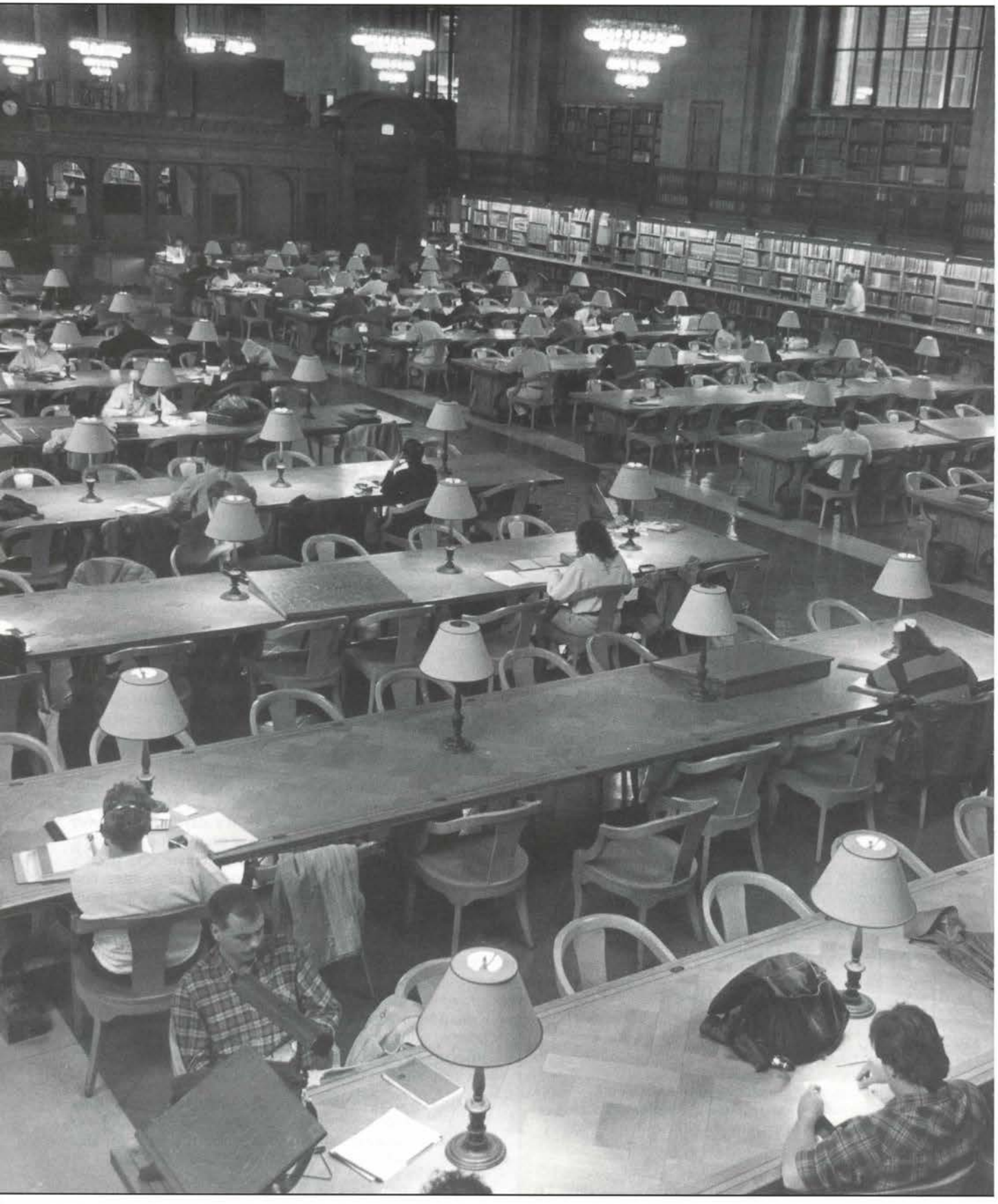
Examples of Queries

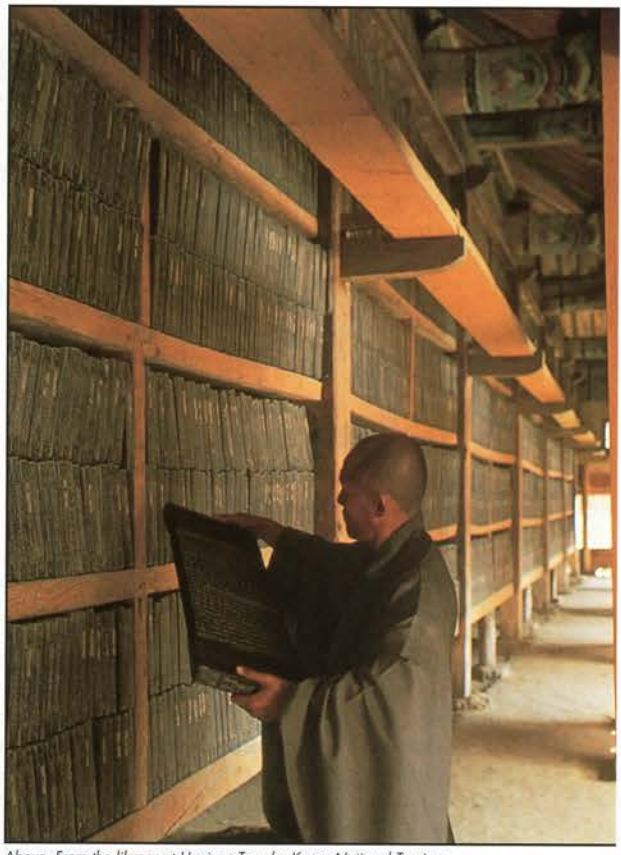
Initiating Queries

- What is the author trying to say here?
- What is the author's message?
- What is the author talking about?

Follow-up Queries

- What does the author mean here?
- Did the author explain this clearly?
- Does this make sense with what the author told us before?
- How does this connect with what the author has told us here?
- Does the author tell us why?
- Why do you think the author tells us this now?





Above, From the library at Haeinsa Temple: Korea National Tourism Organization; at left, New York Public Library reading room 315 from Library: The Drama Within, *by the author and photographer Diane Asseo Griliches, published by the University of New Mexico Press, 1996; below, a girl peruses a book in Queens Public Library's Flushing branch: Mitsu Yasukawa / The Washington Post, 1998*

ANOTHER CHANCE

Help for Older Students with Limited Literacy

BY JANE FELL GREENE

Dick and Jane are gone. But if the old readers reappeared in American classrooms today, legions of middle and high school students wouldn't be able to read them. And yet, we assign these same students to read *Of Mice and Men* or *Romeo and Juliet.* When they can't, teachers are reduced to showing the video, holding class discussions, and accepting for-credit projects that require minimal reading and writing: acting out a different ending; taping an interview with a character; making a diorama or a mobile or a poster.

Over the last two decades, middle and high school teachers have faced exploding numbers of students who don't read or write well enough for minimal functioning in their content classes. In large and small, urban and rural, affluent and impoverished school districts across the nation, I work with thousands of teachers who tell me stories like one I recently heard from an eighth-grade teacher in the Southwest: "This year, our district is emphasizing literacy. They gave me a two-hour reading/language arts block. I got a set of eighth-grade literature books and a set of eighth-grade grammar books. There are thirty-four kids in the block. Only one or two can actually read the eighth-grade literature book...you know, Edgar Allen Poe short stories. It's ridiculous. These kids can't read this stuff. Lots of these kids can't read more than about third-grade level, if that. I've brought in a lot of books my own kids had when they were little, just to try to get them reading. Forget the grammar book. Four kids in my block have only been in this country since last summer. They can't speak a word of English. On Thursdays, an ESL teacher pulls them out of the block for about an hour. I really don't know what to do. It's not just reading. They can't spell. They can't write. I'm an English teacher. I really care about these kids. I do. But there's no time for me to cover the material I have to teach *and* to teach them how to read—supposing I knew *how* to teach them to read."

The last National Assessment of Educational Progress (NAEP; U.S. Department of Education, 1995) astonished educators with the revelation that only about a quarter of fourth graders tested could actually read at or above a fourth-grade level. Older students' performance was exponentially more tragic. Those fourth graders were sent on to fifth-grade teachers who used fifth-grade materials and who were mandated to teach a fifth-grade curriculum. And so it went. NAEP results told a tale that teachers know well: Each year, more students fall farther behind in basic reading, writing, and spelling.

It's become popular to blame society, to blame television and drugs and parents who work and parents who don't read to their kids. And of course there's some truth to that. But we have our students five days a week for twelve years. What happened? How did we get into such dire straits? Why is it that so many of our kids can't read?

Lots of "experts" now postulate that a significant percentage of people with normal intelligence simply *can't* learn to read. Gregory Adams* would be outraged by the statement; he had been the victim of that notion. When I first met him, Gregory was a nonreader. He had been in special education forever. Gregory told me he was in special ed with Moses. He was just one of those who "couldn't learn to read." In grade nine his teacher introduced his class to a literacy curriculum for older students. Gregory became literate. This is how it happened.

The Mission

In the sixties and seventies, I was a high school English teacher. By the mid seventies, I became aware that lots of my kids weren't reading. Not because they wouldn't. They couldn't. I trudged back to grad school. My mission: to figure out how to make readers of nonreaders. It took fifteen years to figure out how to do it well.

I entered the eighties with a new doctorate in reading and linguistics and a new job. As a college professor, I taught reading courses to undergraduate and graduate students. My students and I were running a clinical reading laboratory, spending long, hard hours working one-to-one with kids in the community. There

Jane Fell Greene is a literacy consultant to school districts nationwide.

**Students' real names are not used in this article.*

were hundreds of kids on our waiting list. My worst headache each semester was calling parents who had applied, but whose children we couldn't serve. The same kids would apply for several succeeding semesters. We weren't making any significant gains, we weren't closing any gaps, and I knew it. I worried about it, but I knew that nobody worked harder than we did and that my students and I were doing everything I'd learned in my doctoral program. No matter how hard we worked, though, we were barely keeping kids' heads above water in school.

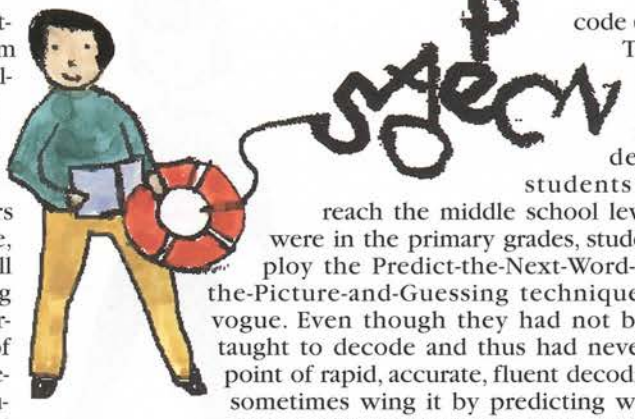
By the mid-eighties, I had begun reading research involving things I hadn't learned in grad school. Scientists were now documenting the importance of phonemic awareness in reading. (Today, we know that phonemic awareness—discriminating and manipulating isolated sounds in words—is the most potent predictor of reading success. See Adams, et al., this issue.) My linguistics training had included a firm foundation in phonology, so I was able to read and understand what these researchers were doing. Over the past two decades, The National Institute of Child Health and Human Development (NICHD)—one of the National Institutes of Health (NIH), the U.S. Department of Education's Office of Research and Improvement, the Office of Special Education Programs, and the Canadian Research Council have all scientifically investigated diverse aspects of reading. I followed this research, implementing what I was learning with our students. I began to question psycholinguistic reading theories (Goodman, 1968; Smith, 1971) I had accepted as gospel in grad school. It became clear that much of what I had been taught in my graduate studies was merely theory—it lacked a rigorous scientific base. In the clinic, we began implementing research-based instructional procedures that reading scientists were disclosing, and we finally began experiencing real success with our students.

Meanwhile, each succeeding year, schools taught more and more literature and less and less literacy. Basic skills were denigrated, and certainly, it was argued, shouldn't be taught directly. All would be well if only kids were enveloped in a "literacy-rich environment." I recalled one of my own reading professors, who'd repeatedly warned, "Never teach phonics." That advice resounded throughout America's colleges of education for twenty years (Moats, 1995). At the end of the nineties, many teachers say it's the spiel they still hear in reading courses. I have heard variations on one same theme reprised by teachers around the country. It goes something like this: "I went back to grad school to learn more about how to teach reading. When I finished, they told me I was a reading specialist. Diploma in hand, I thought to myself, 'Yes, but how do you teach somebody *how* to read?'"

As the "dump-the-skills-and-drills" philosophy became thoroughly entrenched in our area, our waiting list continued to multiply. Success with our students was rewarding, but the more deeply I became involved in phonemic awareness, explicit, systematic phonics, code-based instruction, and decoding to the level of automaticity, the more derision I faced from my professional colleagues, trendily afloat in the anti-skills current. Once I overhead two colleagues discussing how I'd really "gone overboard with this ludicrous phonics stuff." They used terms like "boring," "drill and kill," and "phonic-damaged children." But I knew our kids weren't bored. They were turning on to reading and writing. I also knew this wasn't about me. It was about kids. I tried to put it aside.

My biggest headache was the realization that we couldn't help older kids one at a time. We'd have to figure out a way to deliver literacy to kids who'd fallen behind. And we'd have to figure out a way to deliver it in a *classroom,* not in a pullout or a tutorial. We needed something that would be comprehensive but that would permit teachers to individualize through small-group, rather than whole-group instruction. I knew from my years as a middle and high school teacher that a "program" wasn't enough. Lots of "pro-

grams" were available—but launching literacy in a middle or high school classroom was another thing. While research was illustrating the critical importance of explicit, systematic phonics for delayed readers and writers, teachers also had to involve students in literature, comprehension, and composition. Even if teachers *did* begin teaching older kids to decode, they'd still be responsible for teaching all the strands of the curriculum. And reading delay didn't imply thinking delay: Higher-order thinking would have to be a part of the curriculum from the beginning. To create a comprehensive intervention curriculum, we would have to incorporate and integrate composition, grammar, vocabulary, spelling, and literature that the kids could really read. And we'd have to organize *all* these strands at *every* level, since students' mastery levels were all over the map. Teachers couldn't possibly individualize instruction in decoding, comprehension, spelling, vocabulary, grammar, and literature for thirty kids. Even special ed teachers weren't able to do it with smaller numbers.



I began to realize that teachers could only address the issue of literacy in middle and high schools if they had a comprehensive, fully integrated curriculum designed for ease of implementation and individualization. If such a curriculum existed, and if we could provide professional development for middle and high school teachers, we could rescue millions of older kids who'd been written off. I knew what needed to be done.

How Education Confused Literat*ure* with Literac*y*

Over the past twenty years, America's schools have become heavily invested in what's often called "literature-based instruction." The nomenclature itself has confused lots of people. Who's against literature? It's like baseball and apple pie. The problem is, literature isn't literacy. Good teachers have always read to and surrounded their students with good literature; that immersion was nothing new. But in order for *students* to read literature, they must first learn *how* to read. Literature-based instruction appeared to be ignoring what science was teaching us about effective reading instruction (Stanovich, 1991). It was based largely on the theory that children who were immersed in language and literature became good readers and writers because language acquisition was a "natural" human phenomenon. This hypothesis has now been thoroughly discredited (Adams & Bruck, 1995). Clearly, young children who are immersed in language and literature will develop spoken language. Spoken language acquisition *is* a natural human phenomenon. Written language acquisition, however, is not (Liberman, 1990). A quick review of history and anthropology reveals that most societies never developed a written language, no matter how rich the culture or how intricate the spoken language. Written language is invented; it is code based. To become literate, students must become masters of the code (Lyon, 1998).

The lack of a firm foundation in decoding becomes devastating for students when they reach the middle school level. When they were in the primary grades, students could employ the Predict-the-Next-Word-by-Looking-at-the-Picture-and-Guessing technique currently in vogue. Even though they had not been explicitly taught to decode and thus had never reached the point of rapid, accurate, fluent decoding, they could sometimes wing it by predicting words that they were familiar with. For example, given "*John had a little red* _____," most children predict *wagon*. The word *wagon* is in their listening vocabulary. Off they go to middle school, relying on guessing at words they can't decode. But during middle school, kids reach a "break point" in reading, a point at which contextual guessing is no longer effective. Three factors contribute to this phenomenon:

a) New content-area vocabulary words do not preexist in their listening vocabularies. They can guess *wagon*. But they can't guess *circumnavigation* or *chlorophyll* based on context (semantics, syntax, or schema); these words are not in their listening vocabularies.

b) When all of the words readers never learned to decode in grades one to four are added to all the textbook vocabulary words that don't preexist in readers' listening vocabularies, the percentage of unknown words teeters over the brink; the text now contains so many unknown words that there's no way to get the sense of the sentence.

c) Text becomes more syntactically embedded, and comprehension disintegrates. Simple English sentences can be stuffed full of prepositional phrases, dependent clauses, and compoundings. Eventually, there's so much language woven into a sentence that readers lose meaning. When syntactically embedded sentences crop up in science and social studies texts, many can't comprehend. Teachers use content-area reading strategies, but these strategies are no bandage for their students' gaping literacy wounds. Textbooks are no longer meaningful or useful. Teachers and students become frustrated. Frustrated teachers leave education; frustrated students drop out.

Two additional factors greatly complicate this already difficult situation. First, few middle and high school teachers are trained in the teaching of reading. Content-area reading courses, commonly required for credentialing of secondary teachers, offer various strategies to enhance comprehension in content-area courses. Content-area reading strategies, however, do not teach students with limited literacy *how* to read. These strategies are no substitute for the direct teaching of reading. Secondary teachers should not be expected to simultaneously teach content-area subject

matter and make their students literate. Such expectations are irrational.

Secondly, even if middle and high school teachers were prepared to deal effectively with the problems of semi-literate students, it would not take long to count the number of school districts who have a systematic means of identifying students that evidence literacy delays. And even if they did, they have no coherent intervention program that teachers can use.

Even in special ed, where many students with reading problems wind up, teachers tell me the literacy effort is usually "scatter shot," randomly stuffing loosely woven gauze into gaping holes. Repeatedly, special education teachers report that their districts have no literacy curriculum continuity for special education students. Some kids never get to verb tense, while others repeat proper nouns for six years in a row. Bits and pieces are pasted together to repair the most severe problems (Mather, 1992). Inclusion programs have drastically reduced the individual time on task that specialists need to teach basic skills directly. Worse, special educators are often required to invest what little time remains in tutoring students through the Peloponnesian Wars and photosynthesis so they can pass orally administered tests. Middle and high school students who receive accommodations and modifications under Section 504 of the Rehabilitation Services Act or special programs become more deeply entangled in webs of failure. Accommodations and modifications are sorry substitutes for literacy.

A Literacy Curriculum for Older Students

By the early nineties, many teachers had begun to agonize over kids who were learning about literature but weren't learning to read. The problem, of course, didn't go away. It got worse. Many of our students, ineligible for special education, nevertheless received accommodations and modifications, including oral testing, extra time on tests, assistance with note taking—everything except a research-based literacy program designed for classroom implementation in middle and high schools.

In 1991, I began seriously thinking about developing such a program: a comprehensive literacy curriculum for delayed readers; an integrated curriculum that would include the literature, language, and composition components that classroom teachers were responsible for teaching. Such a curriculum could be heavy in composition and vocabulary and grammar. Students could be reading literature; they'd just be reading at the level at which they could really read, instead of being required to do something they couldn't do.

Even then, I realized that curriculum materials alone would be insufficient. Two other factors would be critical to relaunching literacy in middle and high schools: First, intensive professional development and follow-up would be crucial for middle and high school teachers, who traditionally have not been responsible for initiating the teaching of reading (likely candidates were English teachers). Retraining would also be critical for elementary teachers, most of whom had received inadequate literacy preparation in colleges of education. Second, it was important that scheduling provide ample instructional time (a two-hour block for credit in reading and English seemed logical). But these two factors would require revamping curriculum and scheduling. And who was going to listen to me, anyway?

I had to try, and the only way to begin was at the beginning. I resurrected my own years in the classroom and remembered all of those at-risk students in my English and reading classes. What would I have needed to make them literate? During the next four years, I thought of and did little else but work on the project. When the curriculum was finished, it was integrated, systematic, and comprehensive; it was individualized and yet could be used in a classroom setting; it interwove components revealed to be scientifically crucial to literacy development and integrated the various strands of a sound reading/language arts curriculum.

Over the next few years, intensive teacher training began in several states; today, the curriculum has been successfully implemented by numerous school districts across the nation. I realize that its success has been due to teachers. When they participate in our professional development courses, teachers feel validated. They've known all along that what they had been asked to do made no sense. Elementary teachers repeatedly tell me they felt ineffective and frustrated by the "method" they were forced to use to teach kids to read, write, and spell. Middle and high school teachers tell me they were "burned out" by the frustrations of trying to teach students who lacked the most basic skills. Some middle and high school teachers prefer to continue teaching conventional literature courses to high achievers, but many wouldn't give up the opportunity to make kids literate—once they know how and have the materials to do it. One teacher summed it up: "It's the difference between covering material and teaching kids. I wish we'd been doing this for the past twenty years. In my mind's eye, I can see all the kids who would have learned to read if I'd had this."

Curriculum Components

Teachers begin by administering a simple placement test that measures encoding (spelling) mastery for each unit's phonology strand. Since encoding follows decoding, and since literacy requires mastery of written language, the mastery of a unit's phonology content cannot be claimed until encoding is mastered. The instrument, contained in the teacher's manual, is simple to administer to a group and requires nothing other than pencil and paper. Invariably, teachers are stunned by their students' placement test results. Teachers' initial guesstimates about students' mastery levels are consistently inflated.

Students are placed in an appropriate unit, based on placement test results, writing samples, and teacher judgment. Older students move through this basic-level material rapidly, but unless it is directly taught, teachers concur that there's too much risk of missing impor-

tant components. Building a firm foundation for literacy, they say, stands their students in good stead as they progress through the curriculum's three levels.

Level One features phonemic awareness, phoneme-grapheme correspondence, decoding, encoding, accuracy and fluency in passage reading, vocabulary, comprehension, wide supplementary reading, introduction to form and function in grammar (nouns, verbs, subjects, predicates), and abundant writing and editing. Objectives are straightforward. For example, students do not simply learn to spell twenty new words each week; rather, they learn how to spell the English Language systematically. Throughout the curriculum, each new concept incorporates what has previously been taught. Unit progression is dependent on concept mastery, as documented by a minimum of 80 percent mastery of the unit's application tasks, as well as other unit requirements in reading and writing.

Level Two. Some students may test in at level two, which introduces three new strands: syllabication (seven syllable types are taught sequentially and cumulatively for vocabulary development and spelling), morphology (Latin roots, prefixes and suffixes are taught for vocabulary and spelling), and Masterpiece Sentences (this strand serves as the vehicle for the direct teaching of syntax for enhancing composition, reading comprehension, and listening comprehension). Level two continues to develop level one's composition and grammar strands. The composition strand emphasizes both narrative and expository writing. Among various other requirements, expository writing emphasizes reading and paraphrasing science and social studies text for report writing.

Level Three incorporates two new strands: Greek morphology (Greek combining forms that constitute much of scientific and technical English vocabulary) and literature. Literature has been *read* through levels one and two, but literature is not *studied* as a subject until students have mastered literacy skills required to comprehend the subject of literature—at the onset of level three. Literary devices like flashback and foreshadowing are directly taught, as are figurative language techniques such as metaphor, hyperbole, and personification. In level three, stories are used to introduce literary concepts such as universal theme, narrative style, tone, point of view, plot development, and character development. The curriculum's supplementary readers feature fourteen protagonists who weave in and out of the stories—characters to whom students can relate. Each of the stories is followed by vocabulary, comprehension, higher-level thinking, and written and spoken language expansion activities. In addition to demonstrating level three's required mastery of vocabulary, English grammar and usage, students continue to be involved in abundant supplementary reading and writing.

Wide supplementary reading is an integral part of the curriculum. The curriculum's units have been assessed by a sophisticated readability formula that provides a readability code for each unit. Using the unit's readability code and computer software that accesses 10,000 titles in fifteen different interest categories, teachers print out lists of books their students can actually read. Students select and read titles from classic literature and fifteen other interest categories that include adventure, sports, science fiction, history, biography, science, friends and relationships, and mystery.

No additional English texts, spelling texts, vocabulary texts, or any other language arts texts are required; the curriculum is both comprehensive and integrated. Extensive teacher training and follow-up classroom coaching are key components of the program.

Table 1

Gains in Reading and Spelling Measures over 12-month Period for Treatment (T) and Comparison (C) groups. (The t-tests presented indicate whether there is a significant difference between scores on the pretest and posttest for that group.)

			Pretest		Posttest				
Subtest	**Group**	***n***	***M***	***SD***	***M***	***SD***	**Gain**	***t*-test**	***p*-value**
Rate	T	45	76.55	18.61	86.66	23.21	10.11	6.96	.00001
(GORT-3)	C	51	86.86	22.78	89.11	21.67	2.25	1.18	NS
Accuracy	T	45	83.22	22.03	94.55	26.98	11.33	7.95	.00001
(GORT-3)	C	51	91.57	26.05	95.39	26.34	3.82	2.57	.01
Comprehension	T	45	82.44	19.12	96.11	24.00	13.66	8.07	.00001
(GORT-3)	C	51	95.19	26.88	99.70	25.77	4.50	2.20	.03
Total Reading	T	45	79.62	22.81	92.62	27.56	13.00	7.34	.00001
(GORT-3)	C	51	94.35	28.99	99.00	29.27	4.65	3.24	.002
Written Expression	T	45	61.22	9.64	83.47	24.50	22.24	6.55	.00001
(PIAT-R)	C	0	—	—	—	—	—	—	—
Spelling	T	45	73.55	15.69	82.57	19.79	9.02	5.72	.00001
(WRAT-R)	C	51	—	—	—	—	—	—	—
Word ID	T	45	74.22	16.13	92.13	22.19	17.91	9.80	.00001
(WRAT-R)	C	51	—	—	—	—	—	—	—

Whole Language within Structured Language

The curriculum is structured; teachers directly teach each unit's concepts sequentially and cumulatively. But within the structured language format are many of the best aspects of whole language. For example: students do wide supplementary reading; teachers read to students; students read to each other; students are heavily involved in writing and in editing their own work; students learn pragmatics, the levels of usage in spoken and in written language; each unit contains a language expansion section designed for students to develop their spoken language abilities; higher-level thinking skills spanning all of the levels of Bloom's Taxonomy are incorporated into every unit; and most importantly, the reading and language arts strands are integrated. The logical links of language are interwoven rather than isolated. Many of these components, used for decades, are claimed by whole language "purists." They are not the property of any camp, however. They are elements of all good reading instruction.

Intervention Results

On completion of the curriculum, a pilot study involving students in six different states was undertaken from 1994 to 1995, with research funding assistance from the National Center for Learning Disabilities. Subjects included young people in trouble with the law, who had been assigned by judges in their communities to six different centers of Associated Marine Institutes. The pilot study's results revealed significant gains. Statistical results are shown in Table One and can be further reviewed in the original research publication (Greene, 1996).

For ease of interpretation, the following general statement assesses middle and high school students' success: Participants averaged gains of about three years in measured literacy areas (isolated word recognition, contextual word recognition, reading comprehension, composition, and spelling) during an average of six months' enrollment in the curriculum.

School districts' evaluation plans have subsequently revealed similar gains among students in both general and special education classes. Success has been so rigorously documented that the Alabama Department of Education recently instituted a three-year statewide pilot through combined efforts of federal programs and special education departments.

* * *

We don't have to give up on older students with limited literacy. The great majority of them do not have serious reading disabilities; they are better described as "curriculum casualties." And we can do something about that. It's not too late. But we must first stop pushing the situation aside as though it's not there. Ninth-grade students whose reading and writing skills are at the third-grade level should not be given "alternative projects for credit" and passed on to the next grade. We do them no favors with that approach. Instead, we should give them what they so desperately need and want: a concentrated, ambitious, research-based literacy curriculum.

I will end with the story of Anthony—an eighteen-year-old-tenth grader who had spent three years in grade nine but still couldn't read or write beyond a basic second-grade level. Frustrated and angry, this minority youth was ready to drop out and head for L.A., where there were "real gangs." But between Anthony's ninth- and tenth-grade years, middle and high school teachers in his south Alabama district received intensive training in our literacy curriculum. Assigned to a two-hour block literacy class in grade ten, this youngster, once destined for a life on the margins of society, started back at the beginning: phonemic awareness, phoneme-grapheme correspondence, writing words and sentences, reading decodable connected text, and expanding his vocabulary. Like his classmates, he rapidly developed reading, writing, and spelling abilities. By the end of the second year, he was writing sophisticated, syntactically varied sentences, paraphrasing content area text, and reading for pleasure. He stayed in school for a senior year during which his elective course was journalism. He wrote a monthly column for his high school newspaper. Now able to write the lyrics to the songs he'd been creating and storing in memory, he recently cut a demo of his own compositions. Literacy has afforded him the ability to participate in society; he has a life. Anthony's personal observation said more than he could possibly have imagined: "I always knew there must be some kind of secret code to reading, but nobody ever taught me the code." □

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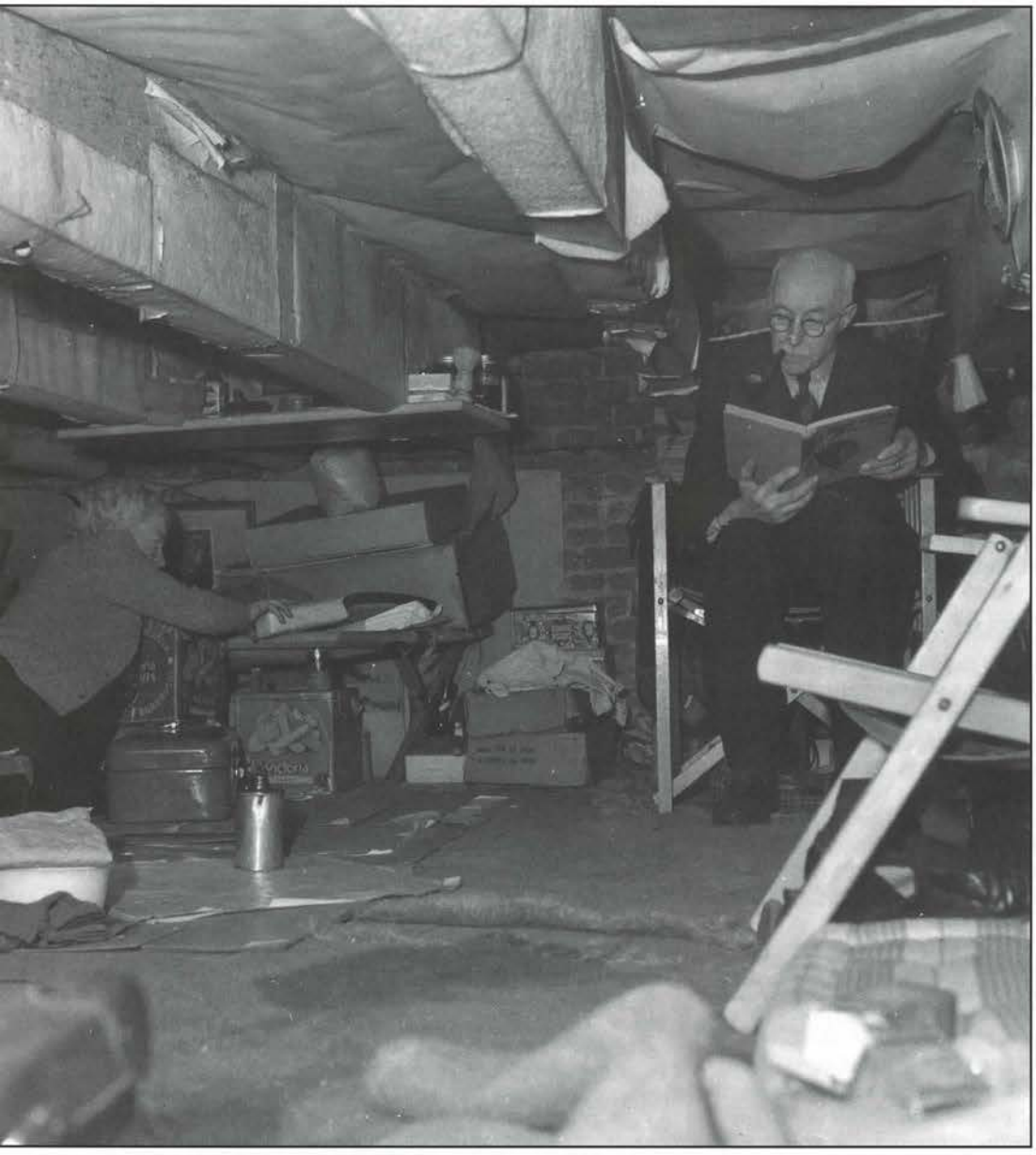
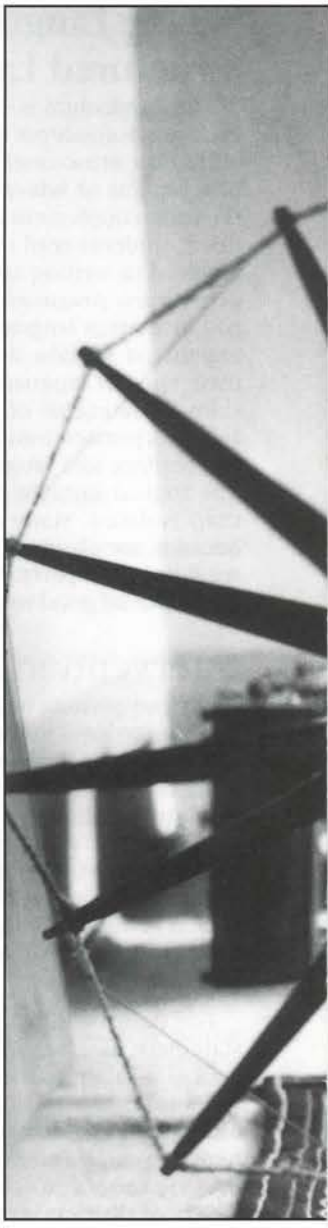
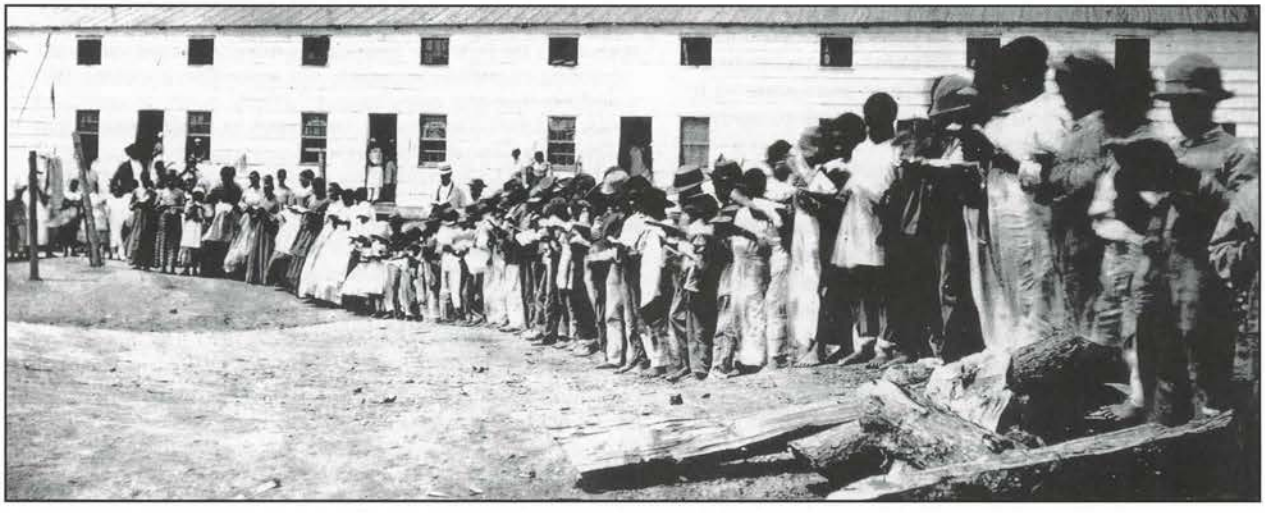
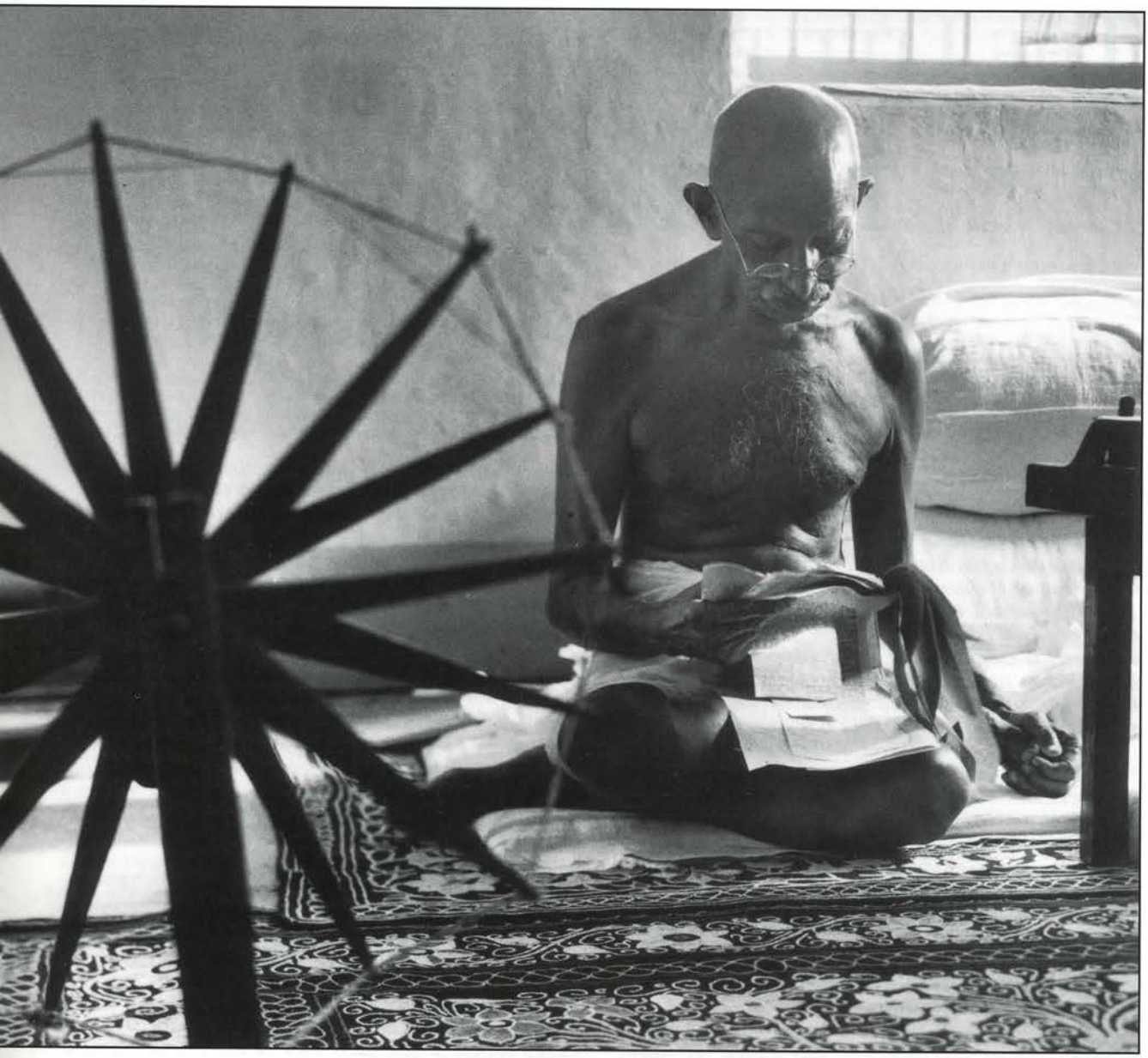
Editor's note: More information about LANGUAGE!, the curriculum program described in this article, can be obtained by writing the National Institute for Continuing Education, P.O. Box 865, Gulf Breeze, Florida 32562. Or you may email the Institute at read@nice-usa.com or visit its website at www.nice-usa.com.









Above left, Jews hiding from the Nazis during World War II, living in secret under the floorboards of a house: © Cas Oorthuys/ The Netherlands Photo Archives; at left, runaway slaves reading during the Civil War: National Archives; above: Ghandi: Margaret Bourke-White / Life Magazine © Time, Inc.; at right, oil on canvas: The Children of Edward IV in the Tower by Paul Delaroche (1830). Photograph by Erich Lessing / Art Resource

The Little Bookstore that Grew To a Thousand

By Lyric Wallwork Winik

Well, this is one of those wonderful stories. We often hear talk of the power of ideas, but seldom do we encounter such a pure example of how one person with a good idea and the determination to carry it out can enrich the lives of so many. Six years ago, in the Spring of 1992, we published an article by a New York City school teacher named Robin Cohen that described how she hit upon the idea of opening a children's bookstore right inside her school building. I told Robin at the time that I was sure, once others heard about it, the idea would spread to many schools across the country. And has it ever! A big helping hand came when Lyric Wallwork Winik, a contributing editor of Parade *magazine, read the article in* American Educator *and wrote a story about it for* Parade, *thus catapulting the idea into the living rooms of millions of Sunday morning newspaper readers.*

To make a long story short, there are now more than one thousand bookstores in forty-seven states across the country, ranging from large cities such as Los Angeles, Houston, and Baltimore, to small towns such as Point Pleasant, West Virginia; Glencoe, Minnesota; and Wiscasset, Maine.

For those of you who missed it the first time around and for everyone who has joined the ranks of teaching since it first appeared, we are reprinting here the article from Parade *magazine, which was featured in its February 14, 1993, issue.*

But there's more to this story. As you will note in the Parade *article, the one problem that Robin and her teacher colleague Veray Darby were having was finding enough low-cost books to enable them to keep the prices they charged the children at an affordable level. They wanted to keep their average cost at about a dollar per book, but that was only possible if they could buy in very large volume from the publishers. That's when Robin Cohen's venture became a family affair. Her son Jess, fresh from Columbia University and starting with his parents' basement as a warehouse, began buying in volume from the publishers and supplying the burgeoning number of school bookstores around the country with reasonably priced, high-quality children's literature. The other two Cohen siblings, Russ and Jennifer, soon joined the effort, and today their business, now in its fifth year and called Invest in Children's Education: The School Bookstore Company, has helped place more than 1 million books into the hands of children. Last November, in appreciation of their work, the Cohens were presented the Friend of Reading Award by the New York State Reading Association, an affiliate of the International Reading Association (IRA).*

So, everyone out there, let's shoot for one thousand more stores. Or why not five thousand more! Let's have our students hanging out at their own school bookstores, browsing, buying, talking about their favorites, taking them home to show their parents and siblings, reading them and sharing them, putting them on their bookshelves and dressers and windowsills and otherwise cluttering the house with them, and returning to them whenever they have a hankering for an old friend.

And finally, let's give a big thank you to Robin Cohen for starting it all.

—Editor

Every Tuesday and Thursday at 7:45 A.M., three cashiers, three security guards and three stock clerks appear at the back door of P.S. 121, an elementary school in New York City's Bronx borough. The employees quickly start unstacking tables and setting up a display rack. By 8 A.M., they have transformed a small, drab entryway into The Children's Bookstore.

During the next thirty minutes, they assist forty to fifty customers and take in $60 to $100. Then these nine employees, all fifth-graders, leave for class. So do their supervisors: Robin Cohen, a reading teacher, who created this thriving bookstore; and her partner, Veray Darby, a fourth-grade teacher.

Cohen explained how the bookstore started: "Students wanted to read outside of class but they had no books. There were no bookstores in this part of the

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This article originally appeared in the February 14, 1993 issue of Parade *magazine and was entitled "These Kids Make Books Their Business." It is reprinted with permission from* Parade *and Lyric Wallwork Winik.*

Bruce Gilbert

Brian Coates

Left: This photo of bookstore founder Robin Cohen helping a student make a selection at the PS 121 bookstore appeared in the original American Educator *story, Spring 1992. Above: Students crowd around the cashiers at the Epps Island Elementary School Children's Bookstore in Houston, Texas.*

Bronx, and the local library's hours had been severely cut. The children were begging for books, and we had nothing for them."

Like many teachers at P.S. 121, Cohen had a classroom library, but she knew her students needed more. "It's vital that students read and be read to at home, so their reading skills grow stronger and they learn to enjoy books," she said.

Using her own money, she bought enough books to fill two large buckets, then let students borrow the books to read at home. There was a $2 replacement fee for lost or damaged books.

Soon, many students were reporting books lost and paying the fines. Cohen thought the children were being irresponsible—until she noticed some of the "lost" books in their book bags and desks. But when she told the students they could return the books and she would refund their money, they refused. They wanted to keep the books. That's when Cohen realized that the students were "buying" their favorite books.

Could something be done to help students own books to read for pleasure? Cohen decided to start a bookstore right inside the school. The idea was a gamble. "We couldn't envision how it would work," recalled Dianne Dessereau, president of the P.S. 121 Parents' Association. But the leaders of the 500-member group were impressed by the enthusiasm of the two teachers. With the parents' support—as well as that of the school's principal, Virginia Fiore, and a $1,300 start-up grant from the New York City Teachers' Consortium—Cohen and Darby bought book racks, a cart, plastic baskets and about $500 worth of books.

The two teachers put up fliers seeking future fifth-graders to work as everything from clerks to book critics to advertising executives. Students had to fill out a job application, stating their qualifications and why they wanted the job. They also needed a teacher's recommendation and a parent's permission. Applicants were interviewed during lunch hour. Then the new employees were trained.

Stock clerks learned how to reorganize display tables and help students make selections. Cashiers learned how to use calculators and make change. Security guards studied how to direct customer traffic and

check that all books purchased had been stamped.

Cohen and Darby also hired students as book critics, who read store selections and wrote reviews. Advertising executives made posters to promote the store. The student employees were paid with certificates redeemable for free books—two certificates a month for employees who arrived on time on the mornings they had selected to work.

Parents devised an inventory system for the bookstore. Except for those with tapes, all books sold for $1.50.

The bookstore opened in the fall of 1991 in an alcove by the school's back door. At first, business was slow. But soon posters, announcements at the school and fliers mailed to homes drew customers. In three months, the bookstore made back its initial investment. It has been operating on its profits ever since.

"We even developed a layaway plan," Cohen said, "because often kids can't pay for a book all at once. The whole thing has become a learning experience. For example, teachers use the critics' reviews as examples of how to write a summary, and the job applications as examples of how to fill out forms.

A majority of the customers at The Children's Bookstore are aged five to eleven. The books are all for children, ranging from classics like *Charlotte's Web* to biographies and books on sports figures. But the bookstore also has attracted adults who come to buy books for their children. "And many parents like being able to spend an extra ten or fifteen minutes with their kids in the morning, browsing in the bookstore," said Dianne Dessereau. "Parents bring in other parents to the bookstore. People talk about the books. The senior kids also get a sense of leadership, a sense of how to relate to people in a workplace."

"When they buy books, the kids are more eager to read them," said Brian McFadden, father of a second-grader, Brian Jr. "My son picks out what he likes, and we sit down and read the books together at home. He also brings his books to school to share with his class."

One morning found Aja Ortiz, a fourth-grader, preparing to purchase a book of mystery stories. "They have a nice selection—books with pictures and also a lot of words," she said. Ian Spence, a second-grader, was examining several books. "I have $1 with me, so I'll put one on layaway," he said, showing four quarters. "I like to look at the books first."

"I'm good with math, and now I'm learning to be good with money," said fifth-grader Tamika Brown, a cashier.

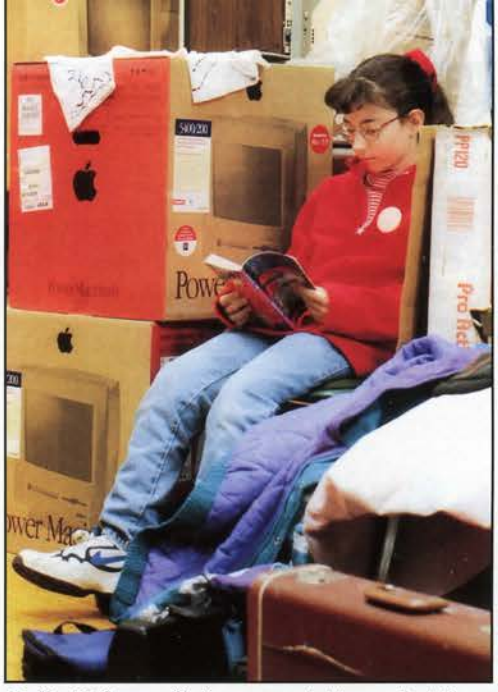

Photo by The Charlotte Observer / Gayle Shomer

Molly McGarvey finds a cozy spot to read at the Eagle's Nest bookstore at McAlpine Elementary School in Charlotte, North Carolina

"I like to help the kids," said Jennifer Piña, a security guard. "It's fun working in a bookstore. I think I might want to do this when I grow up."

As The Children's Bookstore grows, Cohen and Darby face new challenges. "The hardest part is just getting the books," Cohen said. The two have ordered from book clubs' clearance catalogs, bought books from flea-market vendors and driven to a publisher's warehouse sale in search of low-cost books. But more sources are needed. Last summer, Cohen wrote to children's book publishers across the country, seeking to purchase books. Not one replied.

"To keep prices down, we have to keep our average cost to $1 per book," she explained. "Any profits are used to buy new books, and we have also given some money to the school." Last spring, the bookstore helped the school buy a tripod and a video recorder.

Reading always has been important at P.S. 121. "Communication skills—reading, writing, speaking, and listening—are the most important set of skills you can give children in elementary school," said Principal Fiore. Twice a day, every teacher reads a literature selection aloud in class, and there are also silent reading periods, when both students and teachers read books. "Instead of reading textbooks, we use books of literature, such as *Call of the Wild* and *The Diary of Anne Frank,*" Fiore added. "I even give parents a homework assignment: Read to your child at least fifteen minutes a night. A child who is read to will do much better."

She's thrilled that students are still excited about the store—students like Loretta Jackson, ten, a critic who stated on her job application that she wanted to be an undercover detective and a poet. "If I ever stopped reading," Loretta said, "I don't know what would happen to me." □

How To Start a Bookstore In Your School

I.I.C.E. (Invest in Children's Education) Inc., The School Bookstore Company, sells quality books for as little as 99¢ each. They also offer a manual and video on how to start and run a store. For more information, call their toll-free number (1-800-261-9964) or write to them at 80 East Industry Ct., Deer Park, NY 11729. Or to contact Robin Cohen, send her a self-addressed stamped envelope c/o Liberty Elementary School, Dept. P, 142 Lake Road, Valley Cottage, NY 10989.

GETTING AT THE MEANING

(Continued from page 71)

sense with what the author just told us?

HEIDI: This part right here; it's summer now. And this part down here; it's winter, and it snows down here all the time 'cause there's no sun getting down there. Antarctica's right down here, and when the sun comes, Antarctica's getting sun and the sun's coming this way, and it's hitting Antarctica.

Building from Heidi's comment, the teacher recaps what the discussion has revealed so far and prompts students to consider if the author has explained why the sun works this way in Antarctica. The teacher then asks students to recall information that a student had mentioned in an earlier discussion:

TEACHER: Heidi's added some important things. She said that when the globe's going around when it's winter down here, Antarctica never gets any sun, and when it's summer, Antarctica does get sun. Now it seems like that is what the author's telling us. But does the author tell us why?

CLASS: No.

TEACHER: Think about this for a minute. There's something else that Amber said a little while back. She said there's something funny about the earth. It's not straight up and down.

The students begin to work out the explanation for Antarctica's pattern of sunshine and weather:

TAMMY: It's tilted.

TEACHER: It's tilted. Now how does that connect with what the author has told us here?

BRANDY: It doesn't get as much sun in the winter, 'cause the sun has to come up under but it's tilted the other way in the summertime.

THOMAS: I think he's saying, like Brandy said, it goes around for twenty-four hours a day and, here goes the sun, the sun shines on Antarctica, slanted, all the way around twenty-four hours a day.

SHANELLE: Um, um, I think I know what they're saying because when, when the Earth is going around and the sun is coming, it's hitting—the lower part of Antarctica is showing, 'cause it's tilting more. So then it has sunshine twenty-four hours.

As the teacher recaps student contributions, it seems clear that the students have indeed put all the information together; that is, that the tilt in the Earth's axis explains the 24 hours of light in Antarctica.

TEACHER: I think we've worked this out. What Shanelle and Thomas are saying is that because the Earth is tilted when it's going around the sun, we got twenty-four hours of sunlight in the summer, 'cause the sun keeps hitting and keeps hitting Antarctica, even though this part of the globe is in darkness.

There are several specific effects of the *Follow-up Queries* in the "climate of Antarctica" transcript. First, we can see that with the teacher's guidance, the students were able to link past knowledge with new information in the text. Second, as the discussion unfolded, students built on one another's comments to unravel important information: The author was alluding to a scientific concept they had to understand before they could understand the text. Finally, meanings and explanations emerged from several sources, not only from the students, teacher, or text, but also from a collaboration that involved all three.

* * *

Developing and sustaining an environment that encourages students to share their thinking about text ideas and to work toward building meaning is a highly complex task. As Cazden (1988) says, "It is easy to imagine talk in which ideas are explored rather than answers to teachers' test questions provided and evaluated.... Easy to imagine, but not easy to do."

In the course of developing Questioning the Author, we collaborated with fourteen teachers in four different schools, who taught third through eighth grades. And although QtA was "not easy to do," with support each of these teachers became to various degrees competent and comfortable with the orientation, and each of them incorporated their own "styles."

As for the effects on students, teachers often tell us they are surprised at the change that takes place. In a journal she kept during the time we worked together, Kelley Sweeney, one of our first collaborating teachers, described the impact QtA had in her class: "I was astonished at the responses and involvement in the discussion from some of my students who usually never participate. I cannot express my astonishment enough." In this regard, consider a story that Al Shanker used to tell. According to Shanker, if people from Mars came to earth and observed our ways, when they returned they would report that earthlings had a particularly peculiar custom in association with their children. That is, five days a week parents sent their children to a place where the children sat and watched an adult work.

In contrast to that scenario, consider a fifth-grade youngster, who when asked to say what he liked and disliked about QtA, responded, "What I like about QtA is that people let other people know what they're thinking. What I dislike is that it makes us work too hard! When we're done, it makes us feel like we're dead!" □

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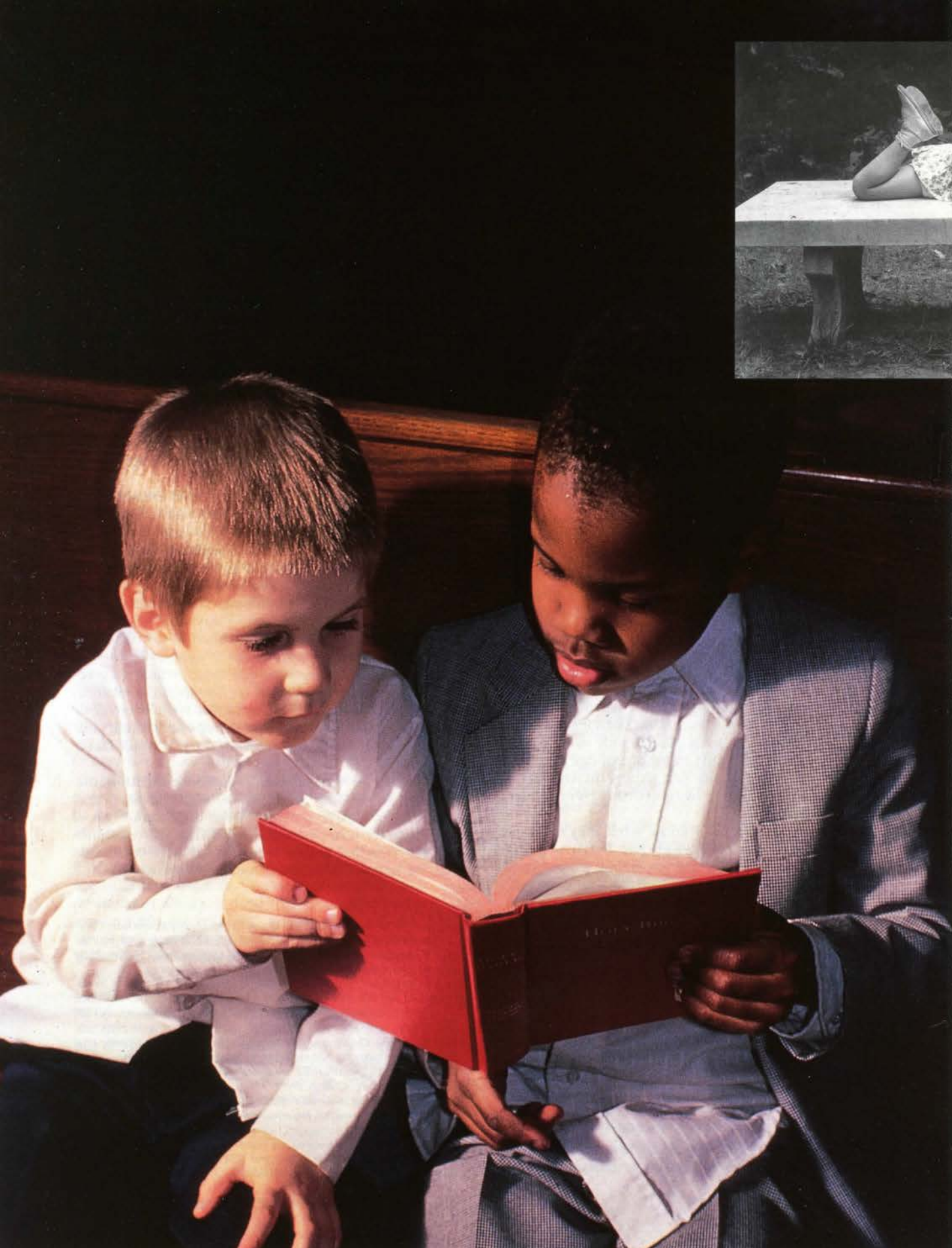

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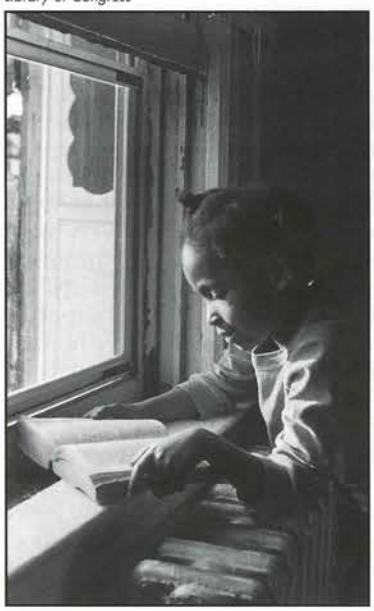
Below, photo by Mark Parfait / courtesy of the American Library Association; at right, photo by Bruce Murphy / courtesy of the Center for the Book in the Library of Congress



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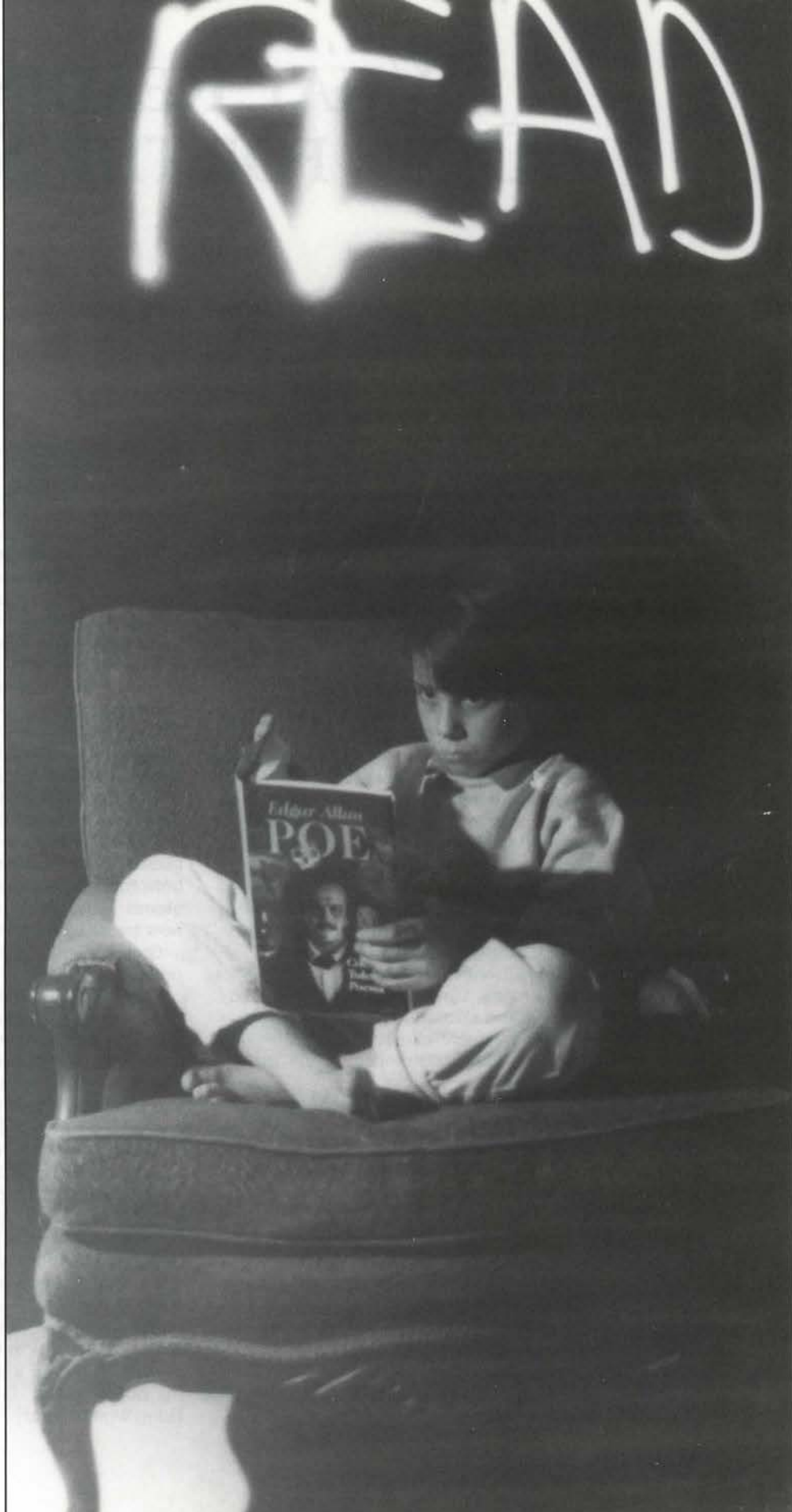


What Reading Does for the Soul

A Girl and Her Books

By Annie Dillard

I began reading books, reading books to delirium. I began by vanishing from the known world into the passive abyss of reading but soon found myself engaged with surprising vigor because the things in the books, or even the things surrounding the books, roused me from my stupor. From the nearest library I learned every sort of surprising thing—some of it, though not much of it, from the books themselves.

The Homewood branch of Pittsburgh's Carnegie Library system was in a Negro section of town—Homewood. This branch was our nearest library; Mother drove me to it every two weeks for many years, until I could drive myself. I only very rarely saw other white people there.

I understood that our maid, Margaret Butler, had friends in Homewood. I never saw her there, but I did see Henry Watson.

I was getting out of Mother's car in front of the library when Henry appeared on the sidewalk; he was walking with some other old men. I had never before seen him at large; it must have been his day off. He had gold-rimmed glasses, a gold front tooth, and a frank, open expression. It would embarrass him, I thought, if I said hello to him in front of his friends. I was wrong. He spied me, picked me up—books and all—swung me as he always did, and introduced Mother and me to his friends. Later, as we were climbing the long stone steps to the library's door, Mother said, "That's what I mean by good manners."

The Homewood Library had graven across its enormous stone facade: Free to the People. In the evenings, neighborhood people—the men and women of Homewood—browsed in the library and brought their children. By day, the two vaulted rooms, the adults' and children's sections, were almost empty. The kind Homewood librarians, after a trial period, had given me a card to the adult section. This was an enormous silent room with marble floors. Nonfiction was on the left.

Beside the farthest wall, and under leaded windows set ten feet from the floor, so that no human being could ever see anything from them—next to the wall, and at the farthest remove from the idle librarians at their curved wooden counter, and from the oak bench where my mother waited in her camel's-hair coat chatting with the librarians or reading—stood the last and darkest and most obscure of the tall nonfiction stacks: Negro History and Natural History. It was in Natural History, in the cool darkness of a bottom shelf, that I found *The Field Book of Ponds and Streams.*

The Field Book of Ponds and Streams was a small, blue-bound book printed in fine type on thin paper, like *The Book of Common Prayer.* Its third chapter explained how to make sweep nets, plankton nets, glass-bottomed buckets, and killing jars. It specified how to mount slides, how to label insects on their pins, and how to set up a freshwater aquarium.

One was to go into "the field" wearing hip boots and perhaps a head net for mosquitoes. One carried in a "ruck-sack" half a dozen corked test tubes, a smattering of screwtop baby-food jars, a white enamel tray, assorted pipettes and eyedroppers, an artillery of cheesecloth nets, a notebook, a hand lens, perhaps a map, and *The Field Book of Ponds and Streams.* This field—unlike the fields I had seen, such as the field where Walter Milligan played football—was evidently very well watered, for there one could find, and distinguish among, daphniae, planaria, water pennies, stonefly larvae, dragonfly nymphs, salamander larvae, tadpoles, snakes, and turtles, all of which one could carry home.

That anyone had lived the fine life described in Chapter 3 astonished me. Although the title page indicated quite plainly that one Ann Haven Morgan had written *The Field Book of Ponds and Streams,* I nevertheless imagined, perhaps from the authority and freedom of it, that its author was a man. It would be good to write him and assure him that someone had found his book, in the dark near the marble floor at the Homewood Library. I would, in the same letter or in a

Annie Dillard is the author of numerous books, including the Pulitzer Prize-winning Pilgrim at Tinker Creek. *This essay is excerpted from* An American Childhood, *her memoir of growing up in Pittsburgh in the 1950s.* An American Childhood *is available in paperback by Harper Perennial Library.*

subsequent one, ask him a question outside the scope of his book, which was where I personally might find a pond, or a stream. But I did not know how to address such a letter, of course, or how to learn if he was still alive.

I was afraid, too, that my letter would disappoint him by betraying my ignorance, which was just beginning to attract my own notice. What, for example, was this noisome-sounding substance called cheesecloth, and what do scientists do with it? What, when you really got down to it, was enamel? If candy could, notoriously, "eat through enamel," why would anyone make trays out of it? Where—short of robbing a museum—might a fifth-grade student at the Ellis School on Fifth Avenue obtain such a legendary item as a wooden bucket?

The Field Book of Ponds and Streams was a shocker from beginning to end. The greatest shock came at the end.

When you checked out a book from the Homewood Library, the librarian wrote your number on the book's card and stamped the due date on a sheet glued to the book's last page. When I checked out *The Field Book of Ponds and Streams* for the second time, I noticed the book's card. It was almost full. There were numbers on both sides. My hearty author and I were not alone in the world, after all. With us, and sharing our enthusiasm for dragonfly larvae and single-celled plants, were, apparently, many Negro adults.

Who were these people? Had they, in Pittsburgh's Homewood section, found ponds? Had they found streams? At home, I read the book again; I studied the drawings; I reread Chapter 3; then I settled in to study the due-date slip. People read this book in every season. Seven or eight people were reading this book every year, even during the war.

Every year, I read again *The Field Book of Ponds and Streams.* Often, when I was in the library, I simply visited it. I sat on the marble floor and studied the book's card. There we all were. There was my number. There was the number of someone else who had checked it out more than once. Might I contact this person and cheer him up? For I assumed that, like me, he had found pickings pretty slim in Pittsburgh.

The people of Homewood, some of whom lived in visible poverty, on crowded streets among burned-out houses—they dreamed of ponds and streams. They were saving to buy microscopes. In their bedrooms they fashioned plankton nets. But their hopes were even more vain than mine, for I was a child, and anything might happen; they were adults, living in Homewood. There was neither pond nor stream on the streetcar routes. The Homewood residents whom I knew had little money and little free time. The marble floor was beginning to chill me. It was not fair.

I had been driven into nonfiction against my wishes. I wanted to read fiction, but I had learned to be cautious about it.

"When you open a book," the sentimental library posters said, "anything can happen." This was so. A book of fiction was a bomb. It was a land mine you wanted to go off. You wanted it to blow your whole day. Unfortunately, hundreds of thousands of books were duds. They had been rusting out of everyone's way for so long that they no longer worked. There was no way to distinguish the duds from the live mines except to throw yourself at them headlong, one by one.

The suggestions of adults were uncertain and incoherent. They gave you Nancy Drew with one hand and *Little Women* with the other. They mixed good and bad books together because they could not distinguish between them. Any book that contained children, or short adults, or animals, was felt to be a children's book. So also was any book about the sea—as though danger or even fresh air were a child's prerogative—or

any book by Charles Dickens or Mark Twain. Virtually all British books, actually, were children's books; no one understood children like the British. Suited to female children were love stories set in any century but this one. Consequently one had read, exasperated often to fury, *Pickwick Papers, Désirée, Wuthering Heights, Lad, a Dog, Gulliver's Travels, Gone With the Wind, Robinson Crusoe, Nordhoff,* and *Hall's Bounty* trilogy, *Moby-Dick, The Five Little Peppers, Innocents Abroad, Lord Jim, Old Yeller.*

The fiction stacks at the Homewood Library, their volumes alphabetized by author, baffled me. How could I learn to choose a novel? That I could not easily reach the top two shelves helped limit my choices a little. Still, on the lower shelves I saw too many books: Mary Johnson, *Sweet Rocket;* Samuel Johnson, *Rasselas;* James Jones, *From Here to Eternity.* I checked out the last because I had heard of it; it was good. I decided to check out books I had heard of. I had heard of *The Mill on the Floss.* I read it, and it was good. On its binding was printed a figure, a man dancing or running; I had noticed this figure before. Like so many children before and after me, I learned to seek out this logo, the Modern Library colophon.

The going was always rocky. I couldn't count on Modern Library the way I could count on, say, *Mad* magazine, which never failed to slay me. *Native Son* was good, *Walden* was pretty good, *The Interpretation of Dreams* was okay, and *The Education of Henry Adams* was awful. *Ulysses,* a very famous book, was also awful. *Confessions* by Augustine, whose title promised so much, was a bust. *Confessions* by Jean-Jacques Rousseau was much better, though it fell apart halfway through.

In fact, it was a plain truth that most books fell apart halfway through. They fell apart as their protagonists quit, without any apparent reluctance, like idiots diving voluntarily into buckets, the most interesting part of their lives, and entered upon decades of unrelieved tedium. I was forewarned, and would not so bobble my adult life; when things got dull, I would go to sea.

Jude the Obscure was the type case. It started out so well. Halfway through, its author forgot how to write. After Jude got married, his life was over, but the book went on for hundreds of pages while he stewed in his own juices. The same thing happened in *The Little Shepherd of Kingdom Come,* which Mother brought me from a fair. It was simply a hazard of reading. Only a heartsick loyalty to the protagonists of the early chapters, to the eager children they had been, kept me reading chronological narratives to their bitter ends. Perhaps later, when I had become an architect, I would enjoy the latter halves of books more.

This was the most private and obscure part of life, this Homewood Library: a vaulted marble edifice in a mostly decent Negro neighborhood, the silent stacks of which I plundered in deep concentration for many years. There seemed then, happily, to be an infinitude of books.

I no more expected anyone else on earth to have read a book I had read than I expected someone else to have twirled the same blade of grass. I would never meet those Homewood people who were borrowing *The Field Book of Ponds and Streams;* the people who read my favorite books were invisible or in hiding, underground. Father occasionally raised his big eyebrows at the title of some volume I was hurrying off with, quite as if he knew what it contained—but I thought he must know of it by hearsay, for none of it seemed to make much difference to him. Books swept me away, one after the other, this way and that; I made endless vows according to their lights, for I believed them.

* * *

AFTER I read *The Field Book of Ponds and Streams* several times, I longed for a microscope. Everybody needed a microscope. Detectives used microscopes, both for the FBI and at Scotland Yard. Although usually I had to save my tiny allowance for things I wanted, that year for Christmas my parents gave me a microscope kit.

In a dark basement corner, on a white enamel table, I set up the microscope kit. I supplied a chair, a lamp, a batch of jars, a candle, and a pile of library books. The microscope kit supplied a blunt black three-speed microscope, a booklet, a scalpel, a dropper, an ingenious device for cutting thin segments of fragile tissue, a pile of clean slides and cover slips, and a dandy array of corked test tubes.

One of the test tubes contained "hay infusion." Hay infusion was a wee brown chip of grass blade. You added water to it, and after a week it became a jungle in a drop, full of one-celled animals. This did not work for me. All I saw in the microscope after a week was a wet chip of dried grass, much enlarged.

Another test tube contained "diatomaceous earth." This was, I believed, an actual pinch of the white cliffs of Dover. On my palm it was an airy, friable chalk. The booklet said it was composed of the silicaceous bodies of diatoms—one-celled creatures that lived in, as it were, small glass jewelry boxes with fitted lids. Diatoms, I read, come in a variety of transparent geometrical shapes. Broken and dead and dug out of geological deposits, they made chalk, and a fine abrasive used in silver polish and toothpaste. What I saw in the microscope must have been the fine abrasive—grit enlarged. It was years before I saw a recognizable, whole diatom. The kit's diatomaceous earth was a bust.

All that winter I played with the microscope. I prepared slides from things at hand, as the books suggested. I looked at the transparent membrane inside an onion's skin and saw the cells. I looked at a section of cork and saw the cells, and at scrapings from the inside of my cheek, ditto. I looked at my blood and saw not much; I looked at my urine and saw long iridescent crystals, for the drop had dried.

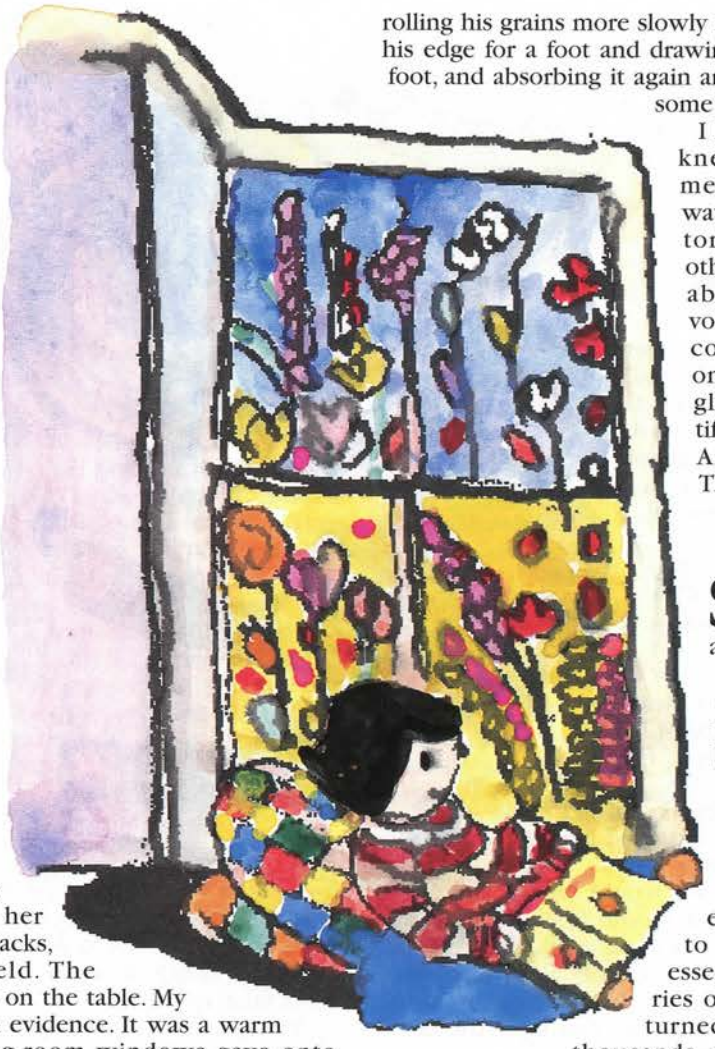
All this was very well, but I wanted to see the wildlife I had read about. I wanted especially to see the famous amoeba, who had eluded me. He was supposed to live in the hay infusion, but I hadn't found him there. He lived outside in warm ponds and streams, too, but I lived in Pittsburgh, and it had been a cold winter.

Finally late that spring I saw an amoeba. The week before, I had gathered puddle water from Frick Park; it

had been festering in a jar in the basement. This June night after dinner I figured I had waited long enough. In the basement at my microscope table I spread a scummy drop of Frick Park puddle water on a slide, peeked in, and lo, there was the famous amoeba. He was as blobby and grainy as his picture; I would have known him anywhere.

Before I had watched him at all, I ran upstairs. My parents were still at the table, drinking coffee. They, too, could see the famous amoeba. I told them, bursting, that he was all set up, that they should hurry before his water dried. It was the chance of a lifetime.

Father had stretched out his long legs and was tilting back in his chair. Mother sat with her knees crossed, in blue slacks, smoking a Chesterfield. The dessert dishes were still on the table. My sisters were nowhere in evidence. It was a warm evening; the big dining-room windows gave onto blooming rhododendrons.



Mother regarded me warmly. She gave me to understand that she was glad I had found what I had been looking for, but that she and Father were happy to sit with their coffee, and would not be coming down.

She did not say, but I understood at once, that they had their pursuits (coffee?) and I had mine. She did not say, but I began to understand then, that you do what you do out of your private passion for the thing itself.

I had essentially been handed my own life. In subsequent years my parents would praise my drawings and poems, and supply me with books, art supplies, and sports equipment, and listen to my troubles and enthusiasms, and supervise my hours, and discuss and inform, but they would not get involved with my detective work, nor hear about my reading, nor inquire about my homework or term papers or exams, nor visit the salamanders I caught, nor listen to me play the piano, nor attend my field hockey games, nor fuss over my insect collection with me, or my poetry collection or stamp collection or rock collection. My days and nights were my own to plan and fill.

When I left the dining room that evening and started down the dark basement stairs, I had a life. I sat next to my wonderful amoeba, and there he was, rolling his grains more slowly now, extending an arc of his edge for a foot and drawing himself along by that foot, and absorbing it again and rolling on. I gave him some more pond water.

I had hit pay dirt. For all I knew, there were paramecia, too, in that pond water, or daphniae, or stentors, or any of the many other creatures I had read about and never seen: volvox, the spherical algal colony; euglena with its one red eye; the elusive, glassy diatom; hydra, rotifers, water bears, worms. Anything was possible. The sky was the limit.

* * *

SINCE WE had moved, my reading had taken a new turn.

Books wandered in and out of my hands, as they had always done, but now most of them had a common theme. This new theme was the source of imagination at its most private—never mentioned, rarely even brought to consciousness. It was, essentially, a time, and a series of places, to which I returned nightly. So also must thousands, or millions, of us who grew up in the 1950s, reading what came to hand. What came to hand in those years were books about the past war: the war in England, France, Belgium, Norway, Italy, Greece; the war in Africa; the war in the Pacific, in Guam, New Guinea, the Philippines; the war, Adolf Hitler, and the camps.

We read Leon Uris's popular novels, *Exodus,* and, better, *Mila 18,* about the Warsaw ghetto. We read Hersey's *The Wall*—again, the Warsaw ghetto. We read *Time* magazine, and *Life,* and *Look.* It was in the air, that there had been these things. We read, above all, and over and over, for we were young, Anne Frank's *The Diary of a Young Girl.* This was where we belonged; here we were at home.

I say, "we," but in fact I did not know anyone else who read these things. Perhaps my parents did, for they brought the books home. What were my friends reading? We did not then talk about books; our reading was private, and constant, like the interior life itself. Still, I say, there must have been millions of us. The theaters of war—the lands, the multiple seas, the very corridors of air—and the death camps in Europe, with their lines of starved bald people...these, combined, were the settings in which our imaginations were first deeply stirred.

Earlier generations of children, European children, I inferred, had had on their minds heraldry and costumed adventure. They read *The Count of Monte Cristo* and *The Three Musketeers.* They read about King Arthur and Lancelot and Galahad; they read about Robin Hood. I had read some of these things and considered them behind me. It would have been pleasant, I suppose, to close your eyes and imagine yourself in a suit of armor, astride an armored horse, fighting a battle for honor with broadswords on a pennanted plain, or in a copse of trees.

But of what value was honor when, in book after book, the highest prize was a piece of bread? Of what use was a broadsword, or even a longbow, against Hitler's armies that occupied Europe, against Hitler's Luftwaffe, Hitler's Panzers, Hitler's U-boats, or against Hitler's S.S., who banged on the door and led Anne Frank and her family away? We closed our eyes and imagined how we would survive the death camps—maybe with honor and maybe not. We imagined how we would escape the death camps, imagined how we would liberate the death camps. How? We fancied and schemed, but we had read too much, and knew there was no possible way. This was a novel concept: Can't do. We were in for the duration. We closed our eyes and waited for the Allies, but the Allies were detained.

Now and over the next few years, the books appeared and we read them. We read *The Bridge Over the River Kwai, The Young Lions.* In the background sang a chorus of smarmy librarians:

> The world of books is a child's
> Land of enchantment.
> When you open a book and start reading
> You enter another world—the world
> Of make-believe—where anything can happen.

We read *Thirty Seconds Over Tokyo,* and *To Hell and Back.* We read *The Naked and the Dead, Run Silent, Run Deep,* and *Tales of the South Pacific* in which American sailors saw native victims of elephantiasis pushing their own enlarged testicles before them in wheelbarrows. We read *The Caine Mutiny, Some Came Running.*

I was a skilled bombardier. I could run a submarine with one hand and evade torpedoes, depth charges, and mines. I could disembowel a soldier with a bayonet, survive under a tarp in a lifeboat, and parachute behind enemy lines. I could contact the Resistance with my high-school French and eavesdrop on the Germans with my high-school German:

"Du! Kleines Mädchen! Bist du französisches Madchen oder bist du Amerikanischer spy?"

"Je suis une jeune fille de la belle France, Herr S.S. Officer."

"Prove it!"

"Je suis, tu es, il est, nous sommes, vous êtes, ils sont."

"Very gut. Run along and play."

What were librarians reading these days? One librarian pressed on me a copy of *Look Homeward, Angel.* "How I envy you," she said, "having a chance to read this for the very first time." But it was too late, several years too late.

At last Hitler fell, and scientists working during the war came up with the atomic bomb. We read *On the Beach, A Canticle for Leibowitz;* we read *Hiroshima.* Reading about the bomb was a part of reading about the war: these were actual things and events, large in their effects on millions of people, vivid in their nearness to each man's or woman's death. It was a relief to turn from life to something important.

At school we had air-raid drills. We took the drills seriously; surely Pittsburgh, which had the nation's steel, coke, and aluminum, would be the enemy's first target.

I knew that during the war, our father, who was 4-F because of a collapsing lung, had "watched the skies." We all knew that people still watched the skies. But when the keen-eyed watcher spotted the enemy bomber over Pittsburgh, what, precisely, would be his moves? Surely he could only calculate, just as we in school did, what good it would do him to get under something.

When the air-raid siren sounded, our teachers stopped talking and led us to the school basement. There the gym teachers lined us up against the cement walls and steel lockers, and showed us how to lean in and fold our arms over our heads. Our small school ran from kindergarten through twelfth grade. We had air-raid drills in small batches, four or five grades together, because there was no room for us all against the walls. The teachers had to stand in the middle of the basement rooms: those bright Pittsburgh women who taught Latin, science, and art, and those educated, beautifully mannered European women who taught French, history, and German, who had landed in Pittsburgh at the end of their respective flights from Hitler, and who had baffled us by their common insistence on tidiness,

above all, in our written work.

The teachers stood in the middle of the room, not talking to each other. We tucked against the walls and lockers: dozens of clean girls wearing green jumpers, green knee socks, and pink-soled white bucks. We folded our skinny arms over our heads, and raised to the enemy a clatter of gold scarab bracelets and gold bangle bracelets.

If the bomb actually came, should we not let the little kids—the kindergartners like Molly, and the first and second graders—go against the wall? We older ones would stand in the middle with the teachers. The European teachers were almost used to this sort of thing. We would help them keep spirits up; we would sing "Frère Jacques," or play Buzz.

Our house was stone. In the basement was a room furnished with a long wooden bar, tables and chairs, a leather couch, a refrigerator, a sink, an ice maker, a fireplace, a piano, a record player, and a set of drums. After the bomb, we would live, in the manner of Anne Frank and her family, in this basement. It had also a larger set of underground rooms, which held a washer and dryer, a workbench, and especially, food: shelves of canned fruits and vegetables, and a chest freezer. Our family could live in the basement for many years, until the radiation outside blew away. Amy and Molly would grow up there. I would teach them all I knew, and entertain them on the piano. Father would build a radiation barrier for the basement's sunken windows. He would teach me to play the drums. Mother would feed us and tend to us. We would grow close.

I had spent the equivalent of years of my life, I thought, in concentration camps, in ghettoes, in prison camps, and in lifeboats. I knew how to ration food and water. We would each have four ounces of food a day and eight ounces of water, or maybe only four ounces of water. I knew how to stretch my rations by hoarding food in my shirt, by chewing slowly, by sloshing water around in my mouth and wetting my tongue well before I swallowed. If the water gave out in the taps, we could drink club soda or tonic. We could live on the juice in canned food. I figured the five of us could live many years on the food in the basement—but I was not sure.

One day I asked Mother: How long could we last on the food in the basement? She did not know what I had been reading. How could she have known?

"The food in the basement? In the freezer and on the shelves? Oh, about a week and a half. Two weeks."

She knew, as I knew, that there were legs of lamb in the freezer, turkeys, chickens, pork roasts, shrimp, and steaks. There were pounds of frozen vegetables, quarts of ice cream, dozens of Popsicles. By her reckoning, that wasn't many family dinners: a leg of lamb one night, rice, and vegetables; steak the next night, potatoes, and vegetables.

"Two weeks! We could live much longer than two weeks!"

"There's really not very much food down there. About two weeks' worth."

I let it go. What did I know about feeding a family? On the other hand, I considered that if it came down to it, I would have to take charge.

It was clear that adults, including our parents, approved of children who read books, but it was not at all clear why this was so. Our reading was subversive, and we knew it. Did they think we read to improve our vocabularies? Did they want us to read and not pay the least bit of heed to what we read, as they wanted us to go to Sunday school and ignore what we heard?

I was now believing books more than I believed what I saw and heard. I was reading books about the actual, historical, moral world—in which somehow I felt I was not living.

The French and Indian War had been, for me, a purely literary event. Skilled men in books could survive it. Those who died, an arrow through the heart, thrilled me by their last words. This recent war's survivors, some still shaking, some still in mourning, taught in our classrooms. *"Wir waren ausgebommt,"* one dear old white-haired Polish lady related in German class, her family was "bombed out," and we laughed, we smart girls, because this was our slang for "drunk." Those who died in this war's books died whether they were skilled or not. Bombs fell on their cities or ships, or they starved in the camps or were gassed or shot, or they stepped on land mines and died surprised, trying to push their intestines back in their abdomens with their fingers and thumbs.

What I sought in books was imagination. It was depth, depth of thought and feeling; some sort of extreme of subject matter; some nearness to death; some call to courage. I myself was getting wild; I wanted wildness, originality, genius, rapture, hope. I wanted strength, not tea parties. What I sought in books was a world whose surfaces, whose people and events and days lived, actually matched the exaltation of the interior life. There you could live.

Those of us who read carried around with us like martyrs a secret knowledge, a secret joy, and a secret hope: There is a life worth living where history is still taking place; there are ideas worth dying for, and circumstances where courage is still prized. This life could be found and joined, like the Resistance. I kept this exhilarating faith alive in myself, concealed under my uniform shirt like an oblate's ribbon; I would not be parted from it.

We who had grown up in the Warsaw ghetto, who had seen all our families gassed in the death chambers, who had shipped before the mast, and hunted sperm whale in Antarctic seas; we who had marched from Moscow to Poland and lost our legs to the cold; we who knew by heart every snag and sandbar on the Mississippi River south of Cairo, and knew by heart Morse code, forty parables and psalms, and lots of Shakespeare; we who had battled Hitler and Hirohito in the North Atlantic, in North Africa, in New Guinea and Burma and Guam, in the air over London, in the Greek and Italian hills; we who had learned to man minesweepers before we learned to walk in high heels—were we going to marry Holden Caulfield's roommate, and buy a house in Point Breeze, and send our children to dancing school? □

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Teaching Decoding

(Continued from page 49)

practice. Instruction in component skills, practice applying those skills in controlled texts, and reinforcement in games and workshops is balanced with listening to and reading literature of all kinds.

If they are taught with care, children can gain sufficient reading skill by the end of first grade to read many books independently. Competence is reinforcing; those who can read are more likely to read. Those who do read are more likely to be educated. And therein lies our responsibility: to teach with knowledge, skill, and artistry the alphabetic invention that makes all this possible. □

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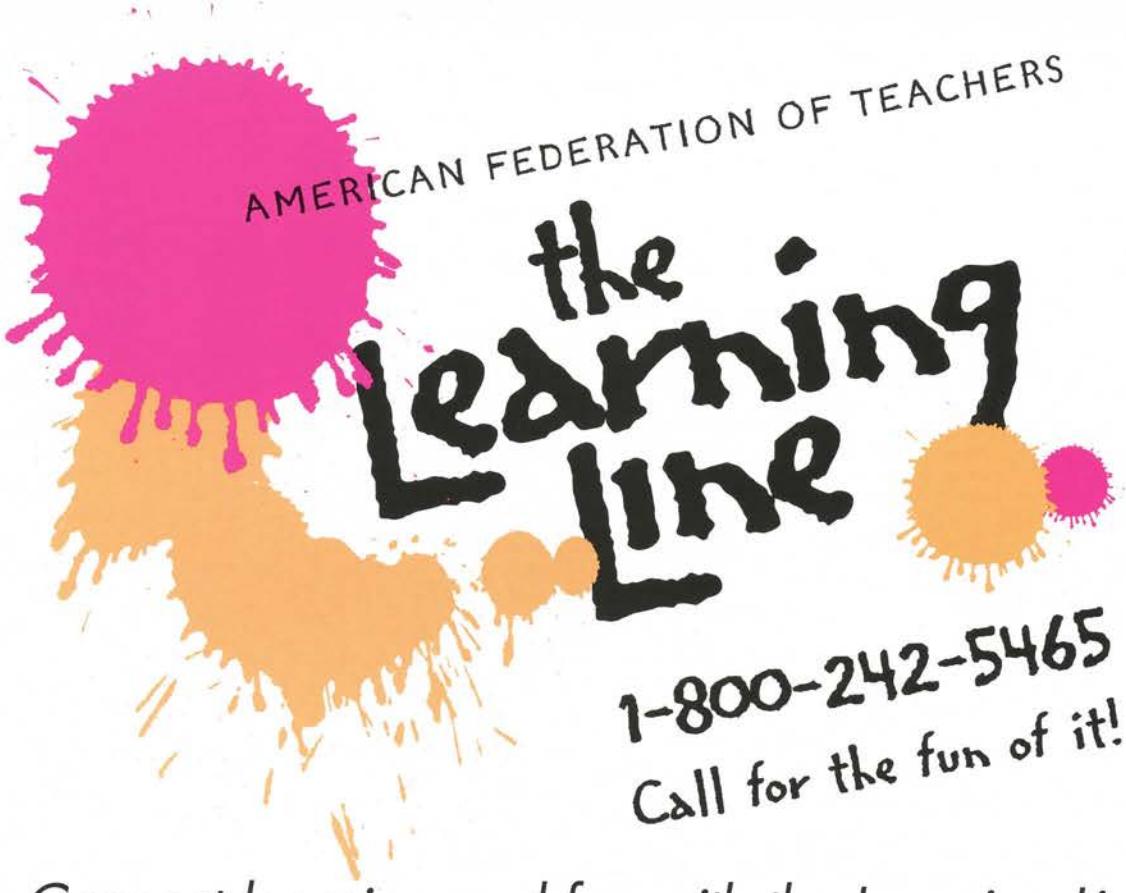

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