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ABSTRACT

A study examined the role of phonics instruction in beginning reading and culminated in a report which has been published as a book entitled "Beginning to Read: Thinking and Learning about Print." The study centered around the debate over whether phonics instruction promotes or impedes development of the attitudes and abilities required for reading comprehension. The study was based on a review of the literature on the merits and demerits of phonics instruction; theory and empirical research related to the nature of reading and its acquisition and mastery; the history of the debate; the relative effectiveness of different instructional approaches; the theory and research on the knowledge and processes involved in skillful reading; and the various literatures relevant to reading acquisition. The studies indicated with impressive frequency that instructional approaches that include systematic phonics lead to higher achievement in both word recognition and spelling, at least in the early grades, and especially for slower or economically disadvantaged students. The study also found that precise identification of the factors underlying the phonics advantage is not possible. Specialized literatures concerning the research and theory on skillful readers, on poor readers, and on children who have not yet entered school are summarized in the report. The overall findings of the study suggest that a child's success in learning to read in the first grade appears to be the best predictor of his or her ultimate success in schooling, yet children's first grade reading achievement is seen to depend most of all on how much they know about reading before they get there. (RS)

Beginning Reading Instruction in the United States

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We are here today to brief you on a report that has just been released on the topic of beginning reading instruction in the United States. The report is entitled *Beginning to read: Thinking and learning about print*. It has been released as a book through the MIT Press. In addition, in the interest of making its content more accessible to educators and the general public, we have produced a *Summary* of the report, available through the Center for the Study of Reading at the University of Illinois.

To keep this briefing brief, I have divided it up into four subtopics: (1) Why this report was written; (2) What I did; (3) What I found; and (4) What these findings mean with respect to reading education and literacy support in the United States. I turn now to each of these subtopics.

Why Was This Report Written?

In 1984, under the auspices of the National Academy of Education, the Center for the Study of Reading produced a report on the status--the strengths and shortcomings--of research and instructional practice in reading education. Following this report, which was entitled *Becoming a Nation of Readers*, Congress asked the U. S. Department of Education to compile a list of available programs on beginning reading instruction, evaluating each in terms of the cost-effectiveness of its phonics component. In partial response to this requirement, I was asked by the Department of Education--and again, through the Center for the Study of Reading at the University of Illinois--to produce a report on the role of phonics instruction in beginning reading. Specifically, my charge as I understood it was to address the following questions: Is phonics a worthwhile component of beginning reading instruction? If so, why? And how might such instruction be most effectively realized?

It should be recognized that the word "phonics" is a red flag to some in the field of reading education. Because of this, the report has been and will be associated with a certain amount of controversy. What is phonics? Phonics is instruction intended to help children to understand the fundamentally alphabetic nature of our writing system and, through that understanding, to internalize the correspondences between frequent spelling patterns and the speech patterns--the words, syllables, and phonemes--that those spellings represent. Phonics, in a nutshell, is any instructional approach that is designed to impart the understanding that the letter *s* says s-s-s-s or that the patterns ____*ight* and ____*ite* rhyme with one another. The debate over phonics centers on whether its instruction promotes or impedes development of the attitudes and abilities required for reading comprehension. Given that the goal of reading instruction is precisely and inarguably to foster not only a willingness to read but further the skill and disposition to do so purposely, reflectively, and productively, I did not dismiss this debate. Instead I centered the report around it.

What Did I Do?

To produce this report, I spent a year reviewing not just the literature on the merits and demerits of phonics instruction per se but also theory and empirical research related to the nature of reading and its acquisition and mastery. I reviewed the history of the debate, the literature on the relative effectiveness of different instructional approaches, the theory and research on the knowledge and processes involved in skillful reading, and the various literatures relevant to reading acquisition.

What made this task especially challenging and especially worthwhile is that the relevant information and arguments are scattered across so many fields. More specifically, the relevant research literature divides itself not only across the fields of education, psychology, and linguistics, but also the fields of computer science and anthropology. Within each of these fields, moreover, the research literature is divided again across scores of subdisciplines. Inasmuch as each of these subdisciplines is supported by its own separate sets of journals and books, each has accrued its own perspective on the issues--along with its own relatively distinct terminology and knowledge base.

Within education, for example, there exist essentially separate literatures on classroom research and practice, on special education and disabilities, on educational psychology, on policy research, and on large-scale statistical modelling and meta-analyses. Within psychology, the relevant literatures include not just those focused rather directly on reading and its acquisition, but also those on cognitive development, on language and text comprehension, on visual perception and pattern recognition, on eye movements, on the dynamics and limitations of attention and active memory, and on the nature of thinking and learning. Within computer science, the work on machine learning, artificial intelligence and computer modelling has provided important means of expanding and testing our theories about learning and the structure of knowledge. At the same time, the linguistics literature provides key insights into the orthography, phonology, syntax, and semantics of English. And the anthropological literature offers ethnographic studies of home literacy support and practice as they vary across different groups in our country.

These are the types of studies that I examined in the course of my review. I am gratified to report that across them, and despite their differences in terminology and perspective, I found considerable overlap in both issues and answers. Still more valuable, I believe, were the ways in which these literature complemented one another. Collectively presented and interrelated, they support a much richer and more refined understanding of the issues and challenges we face in designing, delivering, and evaluating our students' reading education.

What Did I Find?

Perhaps the most influential arguments for teaching phonics are based on studies comparing the relative effectiveness of different approaches to teaching beginning reading. These studies can be sorted into two categories. Those in the first category consist of small but focused laboratory studies. Those in the second category have compared the effectiveness of instructional approaches in real classrooms. Many of the classroom studies have been large-scale, involving hundreds or thousands of children; they include, for example, the research conducted in the 1960s

by Jeanne Chall under the sponsorship of the Carnegie Corporation, the 27 studies of the U.S.O.E. Cooperative Research Program in First-Grade Reading Instruction (1964-1967), and the 22 instructional models evaluated by the Office of Education through the Follow-Through project in the 1970s.

In the quest for answers about instructional effectiveness, these studies offer both good news and bad. The good news is that they suggest, with impressive consistency, that instructional approaches that include systematic phonics lead to higher achievement in both word recognition and spelling, at least in the early grades, and especially for slower or economically disadvantaged students. The bad news is that the studies do not permit precise identification of the factors underlying the phonics advantage. Whereas the laboratory studies provide clean contrasts of whatever variables they were designed to assess, they leave one wondering about the would-be influence of all those factors that were controlled or absent. Conversely, whereas the classroom studies offer real-world validity, they leave one wondering about the many factors that, though unavoidably present, were uncontrolled or unmeasured. Last but hardly least, the overall advantage of phonics instruction across the studies that compare methods of instruction is relatively small.

With this perspective, I turned to the specialized literatures. I will summarize these literatures in three parts, corresponding to research and theory on skillful readers, on poor readers, and on children who have not yet entered school.

Skillful readers. A hallmark of skillful readers is the speed and relative effortlessness with which they typically progress through the words of written text. Laboratory research indicates that, in doing so, they visually process virtually each and every letter of the text. Further, as their eyes pass over the words of the text, their minds automatically and rather irrepressibly translate the spellings of the words into pronunciations. (This happens at the level of mental activity through not necessarily at the level of tongue activity.) Theory and research affirm that both the speed and effortlessness of these activities are integral to the capacity to read with skillful comprehension.

Skillful readers' speed or fluency enables them to think about whole phrases or sentences worth of words at once. This is critically important. The words of a printed passage are presented and perceived one by one. Yet, comprehension operates not on individual words, but on the relations among them. The word "played" means something different in "They played the horses" and "They played the piano;" the language comprehension system is designed to discern these differences by working with whole, cohesive grammatical units--whole phrases or sentences--at once. To comprehend, therefore, readers must read quickly enough to register the last word of each phrase or sentence before the image of the first has faded away. Note further that as the phrases and sentences of students' reading materials become longer and more complex, the demands for speed and fluency increase alongside.

The effortlessness of the word recognition process allows skillful readers to focus their active attention on the process of comprehension--on monitoring and assessing the message of the passage. Bear in mind that a person's conscious or thoughtful attention is limited; it can be directed to only one activity at a time. To the extent that readers must wrestle with the identifies

of individual words or letters of a passage, their attention cannot be directed to its interpretation. When readers deliberate on such detail, they necessarily lose track of meaning. For skillful and novice readers alike, the only cure is to reread the whole phrase or sentence with fluency once its difficulties have been worked out.

The speed and effortlessness with which skillful readers are able to recognize the words of a written passage derive from their deep and overlearned knowledge about English spellings and their corresponding pronunciations. The spellings of frequent words are so familiar that they are effectively recognized as wholes and passed directly to the comprehension processes. But while the vast majority of print consists of relatively few, very frequent words, these oft-repeated words account for but a small fraction--about 5 percent--of the number of different words that appear in our reading materials. Each of the remaining 95 percent of the distinct words we encounter occurs relatively infrequently--on average just a few times per million words of running text. It is here that skillful readers' habit of sounding words out becomes invaluable. Even for wholly unfamiliar words, the spelling-to-sound correspondences are so overlearned that they are run off with near effortlessness; just try it: *hypermetropical, hackmatack, thigmotaxis.* In this way, by meeting, reduplicating, and supplementing the word recognition efforts of the visual system, the speech system generally ensures that those many words of known meaning but marginal or incomplete visual familiarity are recognized with the speed and effortlessness on which comprehension depends. Importantly, it is not the very frequent words (e.g., *the, from, which*) but the relatively infrequent ones (e.g., *germs, fever, bacteria, medicine*) on which the meaning of language depends most.

Poor readers. Research demonstrates that the ability to read English-like nonsense words, such as *zust* and *nell*, is a uniquely powerful discriminator of good from poor readers. Most poor readers have not learned to recognize frequent spelling patterns or to translate spelling patterns to speech patterns. Indeed, many of the symptoms that have variously been ascribed to neurological dysfunction or perceptual deficits are now being traced to insufficient familiarity with the visual forms of individual letters and the ordered, letter-by-letter composition of common English spelling patterns. Similarly, many problems that appear on the face of it to reflect comprehension difficulties are frequently traced to unaffordable efforts, slowness, or incompleteness in the word recognition processes.

Extending these findings, adults and children with poor reading abilities are typically found to have poorly developed awareness of the sound structure of spoken words. Of key importance here is readers' awareness that spoken words are comprised of phonemes. (Phonemes are the smaller-than-a-syllable speech sounds that correspond roughly to the individual letters of the alphabet.) People's awareness of phonemes seem to qualify as a genuine insight. Moreover, partly because listeners' attention is trained to the meanings and not the sounds of language and partly because phonemes are acoustically sloppy entities, it is an insight that eludes many. Even among eminent Chinese scholars, awareness of phonemes is rare unless they have studied an alphabetic language. Among readers of English, those who are successful invariably have phonemic awareness while those who lack phonemic awareness are invariably unsuccessful.

Considerations of human memory and perception argue forcefully that it would be difficult if not impossible to acquire an adequate visual vocabulary without the support of spelling-sound

correspondences. Yet, awareness of phonemes is essential for making sense and use of spelling-sound correspondences. Remedial training in phonemic awareness and phonics are reportedly the most frequent and most successful components of remedial reading programs for disabled readers and of acceleration programs for below-norm classrooms. Research indicates that regularly challenging students to write promotes awareness of phonemes and sensitivity to spelling-sound correspondences. In addition, teaching spelling-sound correspondences that are not in association with the rest of the reading/writing program is shown to be relatively unproductive; in contrast, when phonics lessons and the wording of the stories that children read are coordinated, children are found to use and even extend their phonics knowledge in independent reading. Finally, given a basic understanding of how print works, the single most powerful and unsubstitutable activity that can be undertaken toward increasing students' reading facility--as well as their vocabulary development, writing skills, and conceptual growth--is that of having them read as frequently, broadly, and thoughtfully as possible.

Children who have not yet entered school. Identification of predictors of children's eventual success in learning to read has been an active area of research. Somewhat surprisingly, measures that have proven to be poor predictors of reading success include mental age, IQ, parental education, affluence, handedness, perceptual-motor skills, and oral language characteristics. In contrast, three powerful predictors are (1) preschoolers' ability to recognize and name letters of the alphabet, (2) their general knowledge about text (which is the front of the book and which is the back, whether the story is told by the pictures or the print, and which way to turn the pages of a book), and (3) their awareness of phonemes (the speech sounds that correspond roughly to individual letters).

Of these, preschoolers' awareness of phonemes holds impressive predictive power, statistically accounting for as much as 50% of the variance in their reading proficiency at the end of the first grade. Supporting the hypothesis that phonemic awareness bears a direct, enabling relation to reading success, studies have shown that regimens of preschool games and activities designed to develop phonemic awareness significantly accelerate children's subsequent reading and writing achievement at least through second grade.

Yet, there is a twist in this plot. While a preschooler's phonemic awareness may be the best single predictor of how much that child will learn about reading in school, the best predictor of a preschooler's awareness is found to be how much she or he has already learned about reading. Moreover, ethnographic studies document enormous differences in preschoolers' exposure to print in their homes.

To illustrate, let us consider frequency of storybook reading. Reading aloud with children is known to be the single most important activity for building the knowledge and skills that they will eventually require for learning to read. Happily, then, in American homes where storybook reading occurs with any appreciable frequency, it tends to occur with great regularity, averaging slightly over one session per day. A child who enjoys 30 to 45 minutes of storybook reading per day across the preschool years, will accumulate 1000 to 1700 hours of storybook experience--one on one with her or his face in the book--prior to entering first grade. Adding regular doses of "Sesame Street," reading/writing/language activities in preschool, and time spent fooling around with magnetic letters on the refrigerator or playing word and "spelling" games in the car, on the

computer, with crayons, and so on, such children will have experienced several thousand more hours of literacy preparation before entering first grade. Upon this base and with the continuing help of peer pressure and parental support, their first-grade teacher will be asked to teach them to read. In this endeavor, she is unlikely to spend more than 2 hours per school day. In all, she is unlikely to spend more than 360 hours over the course of the year. And, even during these hours, her attention will necessarily be divided across twenty or so students. Even so and not surprisingly, she will generally succeed with such children.

In contrast to these children, ethnographic research documents that there are many others who enter school with very little literacy preparation. In a home study of 24 preschoolers in a neighborhood with poor school success, storybook time was clocked at less than 2 minutes per day for a total of about 10 hours per year. Moreover, the majority of this time belonged to just one of the children in the study. While storybook reading averaged 26 minutes per day for her, it averaged less than 20 minutes per month--less than 4 hours per year--across the other 23 children.

Extrapolating once more, we can estimate that by the time children with little literacy preparation enter first grade, their home experiences will have prepared them with about 25 hours of storybook reading. The home study indicates that, relative to their well-prepared peers, they will also be short thousands of hours of other sorts of literacy experiences. How can we expect their first-grade teacher to make up for those differences in 360 hours of one-on-twenty instruction? And yet there are many, many teachers and children in the same situation.

Activities that promote phonological awareness and spelling-sound correspondences should be helpful but cannot be sufficient. Theory and research firmly indicate that the system of knowledge and processes that supports reading is complex and interactive. To develop properly, its parts must be developed conjointly. They must be linked together n the very course of acquisition. Importantly, this dependency works in both directions. Development of the higher-order processes is limited without due attention to the lower. Similarly, productive growth and support of lower-order processes depends on constantly clarifying and exercising their connections to the higher-order ones.

Before formal instruction is begun, children should possess a broad, general appreciation of the nature of print. They should be aware of how printed material can look and how it works; that its basic meaningful units are specific, speakable words; and that its words are comprised of letters. Of equal importance, they should have a solid sense of the various functions of print--to entertain, inform, communicate, record--and of the potential value of each of these functions to their own lives. To learn to read, a child must learn what it means to read and that she or he would like to be able to do so. Our classrooms, from preschool on up, must be designed with these concepts in mind.

What Do These Findings Mean?

In all, a child's success in learning to read in the first grade appears to be the best predictor of her or his ultimate success in schooling as well as all of the events and outcomes that correlate with that. Yet, across the literature reviewed in this book, children's first-grade reading

achievement is seen to depend most of all on how much they know about reading before they get there.

In a way, this conclusion seems disheartening; it seems somehow to beg the American Dream. In another way, however, this conclusion is heartening. Differences in reading potential are shown not to be strongly related to poverty, handedness, dialect, gender, IQ, mental age or any other such difficult-to-alter circumstances. They are due instead to learning and experience--and specifically to learning and experience with print and print concepts. They are due to differences that we can teach away--provided, of course, that we have the knowledge, sensitivity, and support to do so.

With respect to the design, delivery, and evaluation of our students' reading progress, we may conclude that the understanding and knowledge that phonics instruction is intended to support are of critical importance to the growing reader. Yet, the findings reported in this book can also be translated into a number of specifics. I mention only a few. First, instructional materials for the classroom and the content of teacher training courses should be redesigned to reflect current knowledge on the nature of reading and its acquisition. As an example, the nature of phonemic awareness and its enabling importance to early reading acquisition has barely permeated either of these domains; yet, as many as 25% of middle-class students and substantially more among those who come from print-poor home environments do not develop phonemic awareness on their own. More generally, the importance of efficient, well-tuned instructional practices is underscored by the fact that holding students back--and that includes placement in "transition" kindergartens--negatively impacts achievement and significantly increases the likelihood that they will drop out of school before graduation. Second, beyond the basics, the single most important activity that can be undertaken in support of reading proficiency as well as writing abilities, vocabulary growth, and conceptual development, is that of having students read frequently; logistically speaking, however, independent reading is one of the most difficult activities to manage in the classroom. We must find a way to induce our students to read more and more often Third, while reading comprehension depends on reflective, analytic thinking (which are also teachable skills), it is strictly limited by reading fluency. In recognition of its fundamental importance and so that its effects will not be confused with shortcomings in higher-order interpretive skills, reading fluency warrants specific assessments in tests of reading ability as we have given it in the design of the 1992 NAEP.

Finally, I reiterate that children's success in learning to read depends most of all on how much they know about reading before formal instruction begins. As daycare legislation is developed by our government, I hope with all my heart that it will recognize that effective daycare, instituted for the children and their families and toward our country's long-term interests, is less about babysitting than it is about child-development. I hope it will be designed to support the environment and personnel that are best able to foster the social, cognitive, and linguistic nurturance that all children need all day long.