

Developing Early Literacy

REPORT OF THE NATIONAL EARLY LITERACY PANEL



A Scientific Synthesis of
Early Literacy Development
and Implications for Intervention

Executive Summary

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The National Assessment of Educational Progress reveals that 37 percent of U.S. fourth graders fail to achieve basic levels of reading achievement. The incidence of reading failure is even higher within low-income families, ethnic minority groups, and English-language learners. Large-scale studies have shown that young children—those entering kindergarten and first grade—vary greatly in their attainment of the early precursor skills that provide the launching pad for later literacy learning (West, Denton, & Germino-Hausken, 2000; West, Denton, & Reaney, 2000). What can be done in U.S. homes, preschools, and kindergartens to better prepare children to succeed in learning to read and write?

In 1997, the U.S. Congress asked that a review of research be conducted to determine what could be done to improve reading and writing achievement. The resulting *Report of the National Reading Panel: Teaching Children to Read* (NICHD, 2000) has been influential in helping to guide reading-education policy and practice in the United States. However, that report did not examine the implications of instructional practices used with children from birth through age 5. To address this gap in the knowledge base, the National Early Literacy Panel (NELP) was convened. The panel was asked to apply a similar methodological review process to that used by the National Reading Panel (NRP) to issues of instructional practices for young children so that parents and teachers could better support their emerging literacy skills.

NELP was appointed in 2002 and carried out its work under the auspices of the National Center for Family Literacy (NCFL). Laura Westberg, director of special projects and research at NCFL directed the effort. The National Institute for Literacy (NIFL) funded the panel's work in consultation with the National Institute for Child Health and Human Development (NICHD), the U.S. Department of Education, and the Office of Head Start in the U.S. Department of Health and Human Services. The panel included the following experts in literacy and early childhood education:

Anne Cunningham, University of California, Berkeley
Kathy Escamilla, University of Colorado at Boulder
Janet Fischel, State University of New York at Stony Brook

Susan H. Landry, University of Texas–Houston
Christopher J. Lonigan, Florida State University
Victoria Molfese, University of Louisville
Chris Schatschneider, Florida State University
Timothy Shanahan, NELP chair, University of Illinois at Chicago
Dorothy Strickland, Rutgers University.

Questions Addressed by the National Early Literacy Panel

NELP’s primary goal was to identify interventions, parenting activities, and instructional practices that promote the development of children’s early literacy skills. Toward that end, the panel posed the following four questions:

1. What are the skills and abilities of young children (age birth through five years or kindergarten) that predict later reading, writing, or spelling outcomes?
2. Which programs, interventions, and other instructional approaches or procedures have contributed to or inhibited gains in children’s skills and abilities that are linked to later outcomes in reading, writing, or spelling?
3. What environments and settings have contributed to or inhibited gains in children’s skills and abilities that are linked to later outcomes in reading, writing, or spelling?
4. What child characteristics have contributed to or inhibited gains in children’s skills and abilities that are linked to later outcomes in reading, writing, or spelling?

NELP adopted a methodology that allowed for the identification and selection of published studies relevant to the panel’s questions, a coding system that allowed for the combination and comparison of studies, and an appropriate method of statistical analysis. Electronic searches were conducted using PsycINFO and the Education Resources Information Center (ERIC), and these were supplemented with hand searches of major research journals, reference checks of past literature reviews, and nominations from leading experts in the field of early literacy. These search procedures yielded more than 8,000 potential articles that were screened to determine their relevance to the research questions and their consistency with all selection criteria established by the panel. This led to the identification of approximately 500 research articles that were used in the meta-analyses conducted by the panel. The meta-analyses summarized both correlational data showing the relationships between children’s early abilities and skills and later literacy development and experimental data that showed the impact of instructional interventions on children’s learning.

Key Findings of the National Early Literacy Panel

Identification of the Domain of Early Literacy Skills

The panel set out first to establish which early skills or abilities could properly be said to be the precursors of later literacy achievement. This was important because, without such

a determination, it would be impossible to ascertain what programs or practices were most effective, because, even in the best of circumstances, most young children develop few conventional literacy skills before starting school. To identify the essential early skills or abilities relevant to later literacy development, the panel searched for published scientific studies that could provide correlational evidence showing the relationship between early skill attainment and later literacy growth in decoding, reading comprehension, or spelling.

Conventional literacy skills refers to such skills as decoding, oral reading fluency, reading comprehension, writing, and spelling. The use of these skills is evident within all literacy practices, and they are readily recognizable as being necessary or useful components of literacy. The term *conventional literacy skills* is not widely used in the field but is adopted here to distinguish between these aspects of literacy that are clearly the focus of the reading, writing, and spelling instruction provided to elementary and secondary students and those earlier-developing precursor skills that may not themselves be used within literacy practice but that may presage the development of conventional literacy skills. Conventional skills can be thought of as being more sophisticated, mature, or later-developing manifestations of reading and writing, and they are to be contrasted with *precursor*, *predictive*, *foundational*, or *emergent skills* (all terms used in this report). The report sometimes uses, more generally, *early literacy skills*, which can refer to both precursor skills and the conventional literacy skills of preschool and kindergarten children.

Conventional reading and writing skills that are developed in the years from birth to age 5 have a clear and consistently strong relationship with later conventional literacy skills. Additionally, six variables representing early literacy skills or precursor literacy skills had medium to large predictive relationships with later measures of literacy development. These six variables not only correlated with later literacy as shown by data drawn from multiple studies with large numbers of children but also maintained their predictive power even when the role of other variables, such as IQ or socioeconomic status (SES), were accounted for. These six variables include

- alphabet knowledge (AK): knowledge of the names and sounds associated with printed letters
- phonological awareness (PA): the ability to detect, manipulate, or analyze the auditory aspects of spoken language (including the ability to distinguish or segment words, syllables, or phonemes), independent of meaning
- rapid automatic naming (RAN) of letters or digits: the ability to rapidly name a sequence of random letters or digits
- RAN of objects or colors: the ability to rapidly name a sequence of repeating random sets of pictures of objects (e.g., “car,” “tree,” “house,” “man”) or colors
- writing or writing name: the ability to write letters in isolation on request or to write one’s own name
- phonological memory: the ability to remember spoken information for a short period of time.

An additional five early literacy skills were also moderately correlated with at least one measure of later literacy achievement but either did not maintain this predictive power when other important contextual variables were accounted for or have not yet been evaluated by researchers in this way. These additionally potentially important variables include

- concepts about print: knowledge of print conventions (e.g., left–right, front–back) and concepts (book cover, author, text)
- print knowledge: a combination of elements of AK, concepts about print, and early decoding
- reading readiness: usually a combination of AK, concepts of print, vocabulary, memory, and PA
- oral language: the ability to produce or comprehend spoken language, including vocabulary and grammar
- visual processing: the ability to match or discriminate visually presented symbols.

These 11 variables consistently predicted later literacy achievement for both preschoolers and kindergartners. Not surprisingly, these measures were usually more predictive of literacy achievement at the end of kindergarten or beginning of first grade than of later literacy growth. The report provides an analysis of the particular relations among these variables. For instance, oral language was found to play a bigger role in later literacy achievement when it was measured using more complex measures that included grammar, the ability to define words, and listening comprehension than when measured using only simple vocabulary knowledge. Also, children’s early PA—that is, their ability to distinguish among sounds within auditory language—was found to be an important predictor of later literacy achievement, expanding on earlier NRP findings.

Instructional Practices That Enhance Early Literacy Skills

The panel also set out to identify studies that employed experimental or quasiexperimental methods to determine the effectiveness of instructional strategies, programs, or practices in imparting conventional literacy skills or any of these precursor skills to young children. The panel did not set out to find evaluations of previously identified programs or interventions but searched for all such studies that had been published in refereed journals in the English language. The panelists then grouped the identified studies into five analytical categories. The categories of intervention and the number of studies within each category included the following:

- Code-focused interventions ($n = 78$): Interventions designed to teach children skills related to cracking the alphabetic code. Most code-focused interventions included PA instruction.
- Shared-reading interventions ($n = 19$): Interventions involving reading books to children. These interventions included studies of simple shared reading and those that encouraged various forms of reader-child interactions around the material being read.

- Parent and home programs ($n = 32$): Interventions using parents as agents of intervention. These interventions may have involved teaching parents instructional techniques to use with their children at home to stimulate children's linguistic or cognitive development.
- Preschool and kindergarten programs ($n = 33$): Studies evaluating any aspect of a preschool or kindergarten program. Ten studies in this category concerned one particular intervention (the Abecedarian Project). Other studies evaluated effects of educational programs, curricula, or policies, such as extended-year experience, on kindergartners.
- Language-enhancement interventions ($n = 28$): Studies examining the effectiveness of an instructional effort aimed at improving young children's language development.

The code-focused instructional efforts reported statistically significant and moderate to large effects across a broad spectrum of early literacy outcomes. Code-focused interventions consistently demonstrated positive effects directly on children's conventional literacy skills. Book-sharing interventions produced statistically significant and moderate-sized effects on children's print knowledge and oral language skills, and the home and parent programs yielded statistically significant and moderate to large effects on children's oral language skills and general cognitive abilities. Studies of preschool and kindergarten programs produced significant and moderate to large effects on spelling and reading readiness. Finally, language-enhancement interventions were successful at increasing children's oral language skills to a large and statistically significant degree. Together, these findings suggest that there are many things that parents and preschools can do to improve the literacy development of their young children and that different approaches influence the development of a different pattern of essential skills.

There is great interest in the idea of providing age-appropriate interventions. However, there were few important differences among these categories of study with regard to age; one important exception was in the area of language interventions, which showed greater effectiveness early on. Otherwise, when age-level comparisons were possible, the large and significant effects of the various interventions were obtained with groups of both younger and older children. This means that most of the types of instruction that are effective in kindergarten are very similar to those that can be used in preschool. Unfortunately, there have not been direct tests of age differentiation in early literacy instruction across kindergarten and preschool, and there are still too few studies of preschool literacy instruction to provide comparison results that can be embraced with a high degree of certainty. Future research into this issue could shed greater light on what, to some observers, may seem a surprising finding.

Few interventions improved conventional literacy skills or the precursor skills most related to later literacy growth, the exception being code-focused interventions. One reason so few interventions were found to foster improvement in these measures is that few intervention studies with young children included measures of such outcomes. Generally, code-focused intervention studies included such measures, while studies of other instructional approaches did not. It is possible that some of these other approaches may also be effective in improving early literacy skills, but that can only be determined through studies employing such measures. Code-focused programs, book sharing, programs for parents to use at home, and language-enhancement instruction all improved children's oral language skills.

The panel wanted to determine whether any child characteristics influenced the effectiveness of the instructional interventions. In most cases, the panel could not determine the role of children's characteristics because of reporting limitations in the original studies. In general, however, variables, such as age, SES, and race, did not seem to alter the effectiveness of the various interventions, and it will take future research to determine whether certain interventions would be effective with particular groups of children.

It should be noted that the interventions that produced large and positive effects on children's code-related skills and conventional literacy skills were usually conducted as one-on-one or small-group instructional activities. These activities tended to be teacher-directed and focused on helping children learn skills by engaging in the use of those skills. Almost all of the code-focused interventions included some form of PA intervention. These PA activities generally required children to detect or manipulate (e.g., delete or blend) small units of sounds in words. Few of the interventions used rhyming activities as the primary teaching approach. Teaching children about the alphabet (e.g., letter names or letter sounds) or simple phonics tasks (e.g., blending letter sounds to make words) seemed to enhance the effects of PA training.

Limitations

The major limitation confronting any meta-analysis is the quality of the original studies that are being combined. All studies have varying degrees of weakness in their implementation and reporting. A basic premise of meta-analysis is that all studies on a particular issue would be unlikely to suffer the same problems and that the influence that such factors may have on results can therefore be analyzed and understood. The reality is that the various study-design features, demographic characteristics of participating children, and crucial elements of the educational environments are hopelessly confounded across studies. Therefore, meta-analysis provides clues to what might be influencing the effectiveness of an intervention but cannot provide the final word on such findings.

It is impossible to be certain that any meta-analysis will identify all studies on a particular topic, and any study that is not included could provide information that would be at odds with the conclusions drawn. In this case, because the meta-analysis examined only the results of published studies, it is possible that a somewhat different picture could be derived if a broader net were cast.

In this case, many substantive issues of great concern to educators and parents could not even be explored adequately because of limitations in the reporting of original studies. There are many theories, both naïve and scientific, suggesting the likelihood of individual differences in instructional effectiveness that demographic characteristics might mitigate. This meta-analysis evaluated whether such variables as race or SES mitigated or moderated the effectiveness of the various interventions. Unfortunately, it was all too rare that the original studies had provided sufficient data to allow for unambiguous conclusions to be drawn.

Future Research Directions

The NELP report provides a rich set of findings about the relationship between early developing child skills and later literacy attainment and the effectiveness of interventions for helping young

children to progress toward successful literacy learning. The analyses carried out by the panel also reveal important gaps in the empirical research record that future research should address.

The panel identified which early measures of children's skills were predictive of later decoding, reading comprehension, and spelling achievement. Some of these variables—certain aspects of phonological processing, for example—have been shown in previous research to be causally connected to literacy achievement (i.e., if those skills are taught, children attain higher levels of literacy), but this is not true for all of these variables. Future research must determine whether enhanced early instruction aimed at improving skills, such as AK, concepts of print, or oral language development, would consistently lead to higher later attainments in literacy.

The panel identified a wide variety of interventions that improved children's early literacy skills, and one pattern that emerged was that the various categories of interventions had qualitatively different outcomes. For example, the code-oriented interventions improved children's knowledge of phonology and print conventions, whereas shared-book interventions enhanced children's language development. It is possible that some of these interventions would actually have a wider impact than what was determined here, but that will require that future studies of such interventions employ a wider range of outcome measures. In fact, this would be a useful research convention for early literacy-intervention research; if such studies would use a wider range of outcome measures, it would be possible to determine the breadth of impact that these interventions may have. Also, given the complementary findings for the various types of intervention, it would be helpful if researchers would undertake longitudinal studies of more complex interventions (such as combinations of the types of efforts that have worked in the past), making it possible to evaluate the long-term value of more ambitious and complete efforts to develop early literacy skills.

Finally, the NELP report found few demographic differences in children's learning patterns, and even those that were found were confounded. Future studies of early literacy skills should consider the possibly varied impact of early interventions, particularly on large and growing groups of children who struggle with literacy (such as second-language learners and children being raised in poverty). However, even if research studies are not designed to specifically answer such questions, it would be helpful if they would report their data separately for children from different demographic categories, as this would make it possible for future meta-analyses to make sense of any patterns that may exist.

Conclusions

The NELP report represents a systematic and extensive synthesis of the published research literature concerning children's early literacy skills. It provides educators and policymakers with important information about the early skills that are implicated in later literacy learning, as well as information about the type of instruction that can enhance these skills. The results also identify areas in which additional research is needed.

The meta-analyses conducted by the panel showed that a wide range of interventions had a positive impact on children's early literacy learning. However, these positive results were due

to the nature and intensity of the instructional activities examined in the studies. There is now a clear need for translational research. Researchers or their agents delivered many of the interventions; examinations of more typical implementations of such programs within early childhood education are needed. Many of the high-impact instructional strategies involved activities and procedures different from those typically seen in early childhood classrooms. These interventions were usually delivered as one-on-one or small-group activities, they occurred frequently, and they were adult-directed. Few interpretable studies evaluated the effects of merely providing a literacy-rich or language-rich classroom environment.

Finally, there were significant problems with the quality of much of the research in this area. Many studies used simple pretest-posttest designs, which provide no causally interpretable evidence, and studies often did not provide evidence that these groups were equivalent prior to an intervention or represented the same population. Often, there was evidence for group differences that existed before the start of the intervention. The panel was unable to rely on the data drawn from such badly designed studies, and they were excluded from all of the analyses reported here. These flaws do not allow appropriate postintervention differences to be attributed unambiguously to the intervention; neither do studies in which the intervention is confounded with other important factors that could be the source of any observed effects. Ultimately, building a larger and more comprehensive knowledge base concerning early literacy skill development and promotion will require more high-quality research.

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