



# The National Early Literacy Panel: A Summary of the Process and the Report

Timothy Shanahan and Christopher J. Lonigan

This article summarizes *Developing Early Literacy: Report of the National Early Literacy Panel*, which was published in 2008. That report provides an extensive meta-analysis of approximately 300 studies showing which early literacy measures correlate with later literacy achievement. It also provides a series of meta-analyses of a comprehensive collection of experimental and quasi-experimental studies of ways of teaching early literacy (preschool and kindergarten) that have been published in refereed journals. These analyses examine the effects of code-based instruction, shared book reading, home/parent interventions, preschool/kindergarten interventions, and early language teaching.

**Keywords:** early childhood; language processes; literacy

Since the development of meta-analysis by Gene Glass (1976), there has been an explosion of research syntheses (Hunter & Schmidt, 2004), including the Cochrane Collaboration ([www.cochrane.org](http://www.cochrane.org)) and the Campbell Collaboration ([www.campbellcollaboration.org](http://www.campbellcollaboration.org)) and a series of high-level reports on educational effectiveness sponsored by the U.S. government aimed at determining what works (August & Shanahan, 2006; National Early Literacy Panel, 2008; National Institute of Child Health and Human Development, 2000; National Mathematics Advisory Panel, 2008). Although research synthesis has existed almost from the beginning of education research (Shanahan, 2000), newer syntheses tend to be more systematic (searches are rules based and replicable), more objective (results emanate from methodology rather than judgment), and more policy or practice oriented than most of the older, narrative syntheses (Shanahan, 2005).

In 2000, the National Reading Panel (NRP) issued *Teaching Children to Read* (National Institute of Child Health and Human Development, 2000), a synthesis of 450 studies on the teaching of reading in Grades K–12. Soon after its release, the federal government adopted it as the basis of U.S. literacy education policy, and programs like Reading First and Early Reading First owe their genesis to that report (Schoenfeld & Pearson, 2009). In 2006, the Thomas Fordham Foundation found the NRP synthesis to be

the third most influential policy work in education, trailing only the National Assessment of Educational Progress and the Trends in International Mathematics and Science Study (Swanson & Barlage, 2006).

The NRP did not purport to review all research on reading education but conducted relatively comprehensive searches on eight topics (phonemic awareness, phonics, oral reading fluency, encouraging children to read, vocabulary, reading comprehension, teacher education, technology), reporting findings for six of these (there was insufficient research on technology and approaches to encouraging reading). Not only did the NRP not consider all topics in reading education (the panel listed approximately 30 topics that had been considered but not pursued), but it was also selective in the student populations studied: It included only studies of first-language learners, K–12.

In 2002, the National Early Literacy Panel (NELP) was convened by the National Institute for Literacy, in consultation with the National Institute of Child Health and Human Development, the U.S. Department of Education, the Head Start Bureau, and the U.S. Department of Health and Human Services, and was directed to apply a methodological review process similar to that used by the NRP. The panel membership is listed in Table 1.

In January 2009, the NELP issued *Developing Early Literacy: Report of the National Early Literacy Panel* (2008; available at <http://www.nifl.gov/earlychildhood/NELP/NELPreport.html>). The present article is a summary of that 231-page research synthesis of approximately 500 empirical studies of early literacy development. *Developing Early Literacy* is not a single research synthesis but six separate syntheses of issues in early literacy education.

## Questions Examined by the NELP

The charge to the NELP was to determine what instructional practices promote the development of children's early literacy skills. Toward that end, the panel posed four questions:

1. What are the skills and abilities of young children (birth through 5 years or kindergarten) that predict later reading, writing, or spelling outcomes?
2. Which instructional approaches or procedures contribute to gains in children's skills and abilities that are linked to later outcomes in reading, writing, or spelling?

**Table 1**  
**Members of the National Early Literacy Panel**

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Laura Westberg, National Center for Family Literacy, Panel Director  
Timothy Shanahan, University of Illinois–Chicago, Panel Chair  
Anne Cunningham, University of California–Berkeley  
Kathy Escamilla, University of Colorado–Boulder  
Janet Fischel, State University of New York–Stony Brook  
Susan H. Landry, University of Texas–Houston  
Christopher J. Lonigan, Florida State University  
Victoria J. Molfese, University of Louisville  
Chris Schatschneider, Florida State University  
Dorothy Strickland, Rutgers University

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3. What environments and settings are related to improvements in children’s skills and abilities that are linked to later literacy outcomes?
4. What child characteristics are related to gains in children’s skills and abilities that are linked to later literacy outcomes?

The NELP adopted a methodology for the identification and selection of published studies relevant to these questions, a coding system to allow for the combining and comparing of studies, and a method of statistical analysis. Electronic searches were conducted using PsycInfo and ERIC, and these were supplemented with hand searches of major research journals, reference checks of past literature reviews, and nominations from leading experts in early literacy. These procedures yielded more than 8,000 published articles that were screened to determine their relevance to the research questions and their consistency with the panel’s selection criteria. This led to the identification of approximately 500 research articles that were used in the meta-analyses. These meta-analyses summarized correlational data showing the relations among children’s early abilities and later literacy development, and experimental data that showed the impact of various kinds of instruction on children’s learning. Only published studies were included in the analyses, which can have a biasing influence on effect sizes due to the tendency of researchers to publish only research with significant effects.

The unit of analysis was the effect sizes from independent groups in the original studies. For Question 1, the data were correlations, and the meta-analytic procedures combined data of studies with similar measures; the results of these analyses are essentially a weighted average correlation of early skills and abilities with later literacy achievement. For Question 2, the data were treatment group contrasts with a control or comparison group (Cohen’s *d*). If homogeneity analysis showed a set of effect sizes to be heterogeneous, then the mediator and moderator analyses were performed to see if differences in such variables were related to the variations in effect sizes.

### Key Findings of the National Early Literacy Panel

#### *Identification of the Domain of Early Literacy Skills*

The panel set out to establish which early skills or abilities could be said to be the precursors of later literacy achievement. Without such a determination it would be impossible to ascertain what practices were most effective, as many young children do not

develop “conventional literacy skills” prior to school entry. The panel considered conventional literacy outcomes (e.g., decoding, fluency, reading comprehension, spelling, writing) but sought to identify other age-appropriate precursors to these conventional measures. Toward that end, the panel searched for published empirical studies that could provide correlational evidence showing the relationship between early skill attainment and later literacy outcomes.

*Conventional literacy skills* refers to skills evident within all literacy practices that are readily recognizable as being necessary or useful components of literacy. The term is adopted here to distinguish between aspects of literacy that are the typical targets of school instruction and those earlier developing precursor skills that may presage the development of conventional literacy skills (Whitehurst & Lonigan, 1998). An example of an early literacy skill could be phonological awareness, the ability to apprehend or manipulate the sounds within spoken language independent of meaning. Phonological awareness is not obvious in typical reading performance, but studies have shown this to be an important skill early in the sequence of decoding development. Another example, oral language skills, also may not be obvious during reading, but theories posit reading comprehension to be a product of decoding and listening comprehension (Hoover & Gough, 1990).

The panel combined data from nearly 300 studies that measured early skills and correlated these with conventional literacy skills that were measured later. It found that conventional reading and writing skills that developed early maintained a consistently strong relationship with those same variables measured later. Early decoding, spelling, reading comprehension, and writing (or name writing) all were strong predictors of later decoding skills, explaining between 25% and 50% of the variance. Similarly, decoding and writing explained 10% to 16% of later reading comprehension. Generally, there were fewer studies aimed at predicting comprehension than decoding, and these comprehension studies included relatively smaller samples and usually resulted in smaller correlations.

Using conventional standards for classifying effect sizes, the NELP classified variables as strong (i.e.,  $r > .50$ ), moderate (i.e.,  $.50 < r < .30$ ), or weak (i.e.,  $r < .30$ ) correlates of conventional literacy skills. Six variables representing early literacy skills had moderate to large predictive relations with later measures of literacy. These six variables maintained their predictive power even when the roles of other variables, such as IQ or socioeconomic status, were accounted for (there are no procedures for meta-analyzing multivariate studies, but the panel analyzed these results descriptively to identify which variables were robust even when other variables were statistically controlled). These six variables include the following:

- *Alphabet knowledge*: Knowing the names and sounds of letters. There were 52 studies ( $n = 7,570$ ) showing an average correlation with later decoding of .50, 17 studies ( $n = 2,038$ ) with an average correlation of .48 with later reading comprehension, and 18 studies ( $n = 2,619$ ) with an average correlation of .54 with later spelling.
- *Phonological awareness*: The ability to detect, manipulate, or analyze the auditory aspects of spoken language independent

of meaning. The panel examined 69 studies ( $n = 8,443$ ) with an average correlation of .40 between phonological awareness and later decoding, 20 studies ( $n = 2,461$ ) with an average correlation of .44 with later reading comprehension, and 21 studies ( $n = 2,522$ ) with an average correlation of .40 with later spelling.

- *Rapid automatized naming of letters/digits*: The ability to name rapidly sequences of random letters or digits. Twelve studies ( $n = 2,081$ ) showed an average correlation of .40 for this variable with decoding, and three studies ( $n = 333$ ) showed an average correlation of .43 with reading comprehension.
- *Rapid automatized naming of objects/colors*: The ability to name rapidly a sequence of repeating random sets of pictures of objects or colors. The average correlation with decoding was .32 (16 studies, 3,100 children); the average correlation with reading comprehension was .42 (6 studies, 1,146 children); and the average correlation with spelling was .31 (6 studies, 1,132 children).
- *Writing/writing name*: The ability to write letters in isolation or to write one's name. The average correlation of writing with decoding was .49 (10 studies, 1,650 children); with reading comprehension it was .33 (4 studies, 565 children); and with spelling it was .36 (3 studies, 397 children).
- *Phonological memory*: The ability to remember spoken information for a short period of time. The average correlation of this variable with decoding was .26 (33 studies, 4,863 children); with reading comprehension it was .39 (13 studies, 1,911 children); and with spelling it was .31 (10 studies, 1,520 children).

Five other variables were moderately correlated with at least one measure of later literacy achievement but either did not maintain this predictive power when other variables were accounted for or had not yet been evaluated in this way. These potentially important variables include the following:

- *Concepts about print*: Knowledge of print conventions (e.g., left-right, front-back) and concepts (e.g., book cover, author, text).
- *Print knowledge*: Skill reflecting a combination of elements of alphabet knowledge, concepts about print, and early decoding.
- *Reading readiness*: Usually a composite of alphabet knowledge, concepts of print, vocabulary, memory, and phonological awareness.
- *Oral language*: The ability to produce or comprehend spoken language.
- *Visual processing*: The ability to match or discriminate visually presented symbols.

These 11 variables predicted preschoolers' and kindergartners' later literacy achievement. There was little evidence that it mattered whether these skills were measured in preschool or kindergarten (i.e., only 25% of the comparisons of preschool and kindergarten results were statistically different from each other). When comparisons were different, the preschool predictions were typically stronger, but in each case the average correlations were in at least the moderate range.

In contrast, the point in time at which later conventional literacy outcomes were measured did influence the size of the predictive relationships. Fifty percent of the correlations differed significantly, depending on when the outcome variable was measured. In all but two cases, the correlation was stronger when the outcome variable was assessed in kindergarten (the correlation of rapid automatized naming of letters/digits was higher with first/second-grade decoding than with kindergarten decoding, and oral language skills were more highly correlated with reading comprehension measured in first and second grade than with kindergarten reading comprehension). But again, even with these differences, the average correlations were in at least the moderate range regardless of when the outcome was measured.

Several variables identified by the NELP as moderate or strong correlates of conventional literacy skills were those suggested by earlier reviews (Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 1998). In-depth analyses of some of the relations between these variables and later conventional literacy skills were able to address theoretically and practically useful issues. One such analysis examined the relations between oral language and later literacy achievement and indicated that oral language was a weaker predictor of conventional literacy (i.e., average  $r$ s of .33, .33, and .36 with decoding, reading comprehension, and spelling, respectively) and did not always maintain its predictive power when other variables were accounted for in multivariate analyses. When the oral language category was broken down by the type of skill measured, the panel found that oral language played a larger role in later literacy achievement when it was measured using more complex or composite measures that included grammar, the ability to define words, and listening comprehension, rather than with measures of simple receptive or expressive vocabulary. The more complex and composite measures of oral language were more closely related to reading comprehension (.70) than to decoding (.58), a pattern that was not evident with simple measures of vocabulary.

A second set of analyses examined how measures of phonological awareness related to conventional literacy skills. These analyses included two dimensions of phonological awareness, linguistic complexity (i.e., the size of the language unit children needed to detect), and type of cognitive operation (e.g., identity, analysis, synthesis). As with the analysis of oral language, composite measures that included multiple levels of linguistic complexity and that required several cognitive operations were the strongest predictors of both decoding and reading comprehension. There were no statistically significant differences, however, between the correlations for measures that involved phonemes and those that involved larger linguistic units (i.e., words, syllables, onset-rime). Analysis tasks (i.e., deleting, counting, substituting sound units) were better predictors of decoding and reading comprehension than were synthesis tasks (i.e., combining sound units) and identity tasks (e.g., matching initial sounds in words), and rhyme tasks had the weakest correlations of the phonological awareness measures.

Overall, these analyses identified a consistent set of variables that had moderate to strong predictive relations with conventional literacy skills in decoding, reading comprehension, and spelling. For most of these predictors, the correlations were generated from a large set of studies involving a large number of

children. Secondary analyses revealed that the strength of the relations for the strong and moderate predictive variables was not substantially moderated by the age at which the predictor variables were measured or the age when the outcome variables were measured.

### *Instructional Practices That Enhance Early Literacy Skills*

The panel then set out to identify studies that employed experimental or quasi-experimental methods to determine the effectiveness of instructional strategies, programs, or practices in teaching conventional literacy skills or any of these precursor skills. The NRP had examined selected topics on reading. In contrast, the NELP identified all of the experimental and quasi-experimental studies that met its criteria and organized and analyzed these by topic. Thus the NELP report is a fairly comprehensive examination of the literature on early literacy instruction, and the five categories of interventions that were examined resulted from the combination of existing studies rather than some predetermined plan. The categories of intervention and the number of studies within each included the following:

- *Code-focused interventions* ( $n = 78$ ): Interventions designed to teach skills related to cracking the alphabetic code.
- *Shared reading interventions* ( $n = 19$ ): Interventions that involved reading books to children, including studies of simple shared reading and those that encouraged reader-child interactions, such as dialogic reading.
- *Parent and home programs* ( $n = 32$ ): Interventions using parents as agents of intervention, including interventions that taught parents instructional techniques to use with their children at home.
- *Preschool/kindergarten programs* ( $n = 33$ ): Studies evaluating any aspect of a preschool or kindergarten program, except for simple code-focused interventions or shared reading interventions (if those interventions were combined together or with other components, they were included in this category). Ten of these studies concerned one intervention (the Abecedarian Project). Other studies evaluated educational programs, curricula, or policies.
- *Language enhancement interventions* ( $n = 28$ ): Studies examining the effectiveness of instructional efforts aimed at improving young children's language development.

*Code-focused interventions.* Results from the meta-analysis of the impacts of code-focused interventions on the early literacy skills of young children found moderate to large effects on the predictors of literacy (such as phonological awareness and alphabet knowledge) and on conventional measures of literacy. Virtually all code-focused interventions included phonological awareness instruction. These phonological awareness activities generally required children to detect or manipulate units of sounds in words. Few of the interventions used rhyming activities as the primary teaching approach. In general, instructional activities that combined phonological awareness training and training on print-related activities yield larger effects across outcome measures. There was no evidence that the effectiveness of code-focused interventions was influenced by children's ages or developmental levels. Few of these interventions were commercially available,

and they involved instructional activities delivered one-on-one or in small groups (in fact, there were no studies of code-focused interventions in which the teaching was delivered to large groups or whole classes). These activities tended to be teacher-directed and focused on helping children learn skills through the use of those skills.

*Shared reading interventions.* Book-sharing interventions produced statistically significant and moderate-size effects on children's oral language skills and print knowledge. All of these studies considered oral language outcomes; only four examined print knowledge, and only two considered any other literacy outcomes. The impact of shared reading interventions was larger for vocabulary outcomes than for more complex aspects of oral language (such as listening comprehension) or complex measures with multiple language components, the kinds of measures that are most closely related to later reading comprehension development. There were no differences in the effects of shared reading based on who did the reading (parents, teachers, or both parents and teachers).

The shared reading interventions differed in the degree of interaction required of the children. Some interventions required a high level of participation (e.g., responding to questions posed by the adult), whereas others required low levels of participation (e.g., listening to the adult read a book). Overall, interactive shared reading interventions yielded larger effect sizes than did noninteractive ones (e.g., effect size of .59 vs. .41). Although this interactive-noninteractive difference was not statistically reliable, it is important to note that most studies of interactive interventions used noninteractive reading as the comparison, whereas most studies of noninteractive reading used a no-treatment comparison. Consequently, the effect size for interactive shared reading represents the additive impact of changing the nature of how shared reading is conducted, whereas the effect size for noninteractive reading represents the impact of increasing the frequency of shared reading versus no additional shared reading.

*Parent and home programs.* Results from the meta-analysis of the impacts of home and parent programs on the literacy skills of young children indicate that these interventions yield a moderate to large effect on oral language outcomes and general cognitive abilities. These interventions had larger impacts on measures of vocabulary (average effect size = .41) than they did on complex measures of oral language (average effect size = .27); however, this difference was not statistically reliable. Only a handful of studies included other literacy outcomes, and none of these was used in enough studies to allow an analysis of their results. The commonality across all of the programs considered in this set of studies was that they involved parents as the agents of intervention; beyond that, the efforts varied greatly (i.e., some programs had general goals of improving children's health, behavior, or cognitive functioning, and other programs had more specific goals such as improving children's oral language skills). It was not possible to examine the additive effects of home and parent programs in the context of high-quality preschool education programs because few studies included both components.

*Preschool and kindergarten programs.* Preschool and kindergarten programs were found to affect children's development of

conventional literacy skills and early literacy skills. The largest impact of these programs was on the readiness measure. The other main effect was a small to moderate impact on spelling outcomes, but this was derived only from kindergarten programs, probably because of the curriculum coverage at that level of instruction.

*Language enhancement interventions.* The meta-analysis of the studies involving language enhancement interventions indicated that these interventions succeeded in increasing children's oral language skills to a large and statistically significant degree. These interventions enhanced performance on a diverse set of oral language measures, including language output (e.g., mean length of utterance, frequency of word use). Language interventions were more effective with younger children than with older ones, so intervening in this area early on might be a sound strategy.

*Moderators of intervention effects.* Together the findings from these five meta-analyses of interventions suggest that there are many things that parents and preschools can do to improve the literacy development of young children and that different approaches influence the development of different patterns of skills. There is great interest in the idea of providing age-appropriate interventions. However there were few important differences among these studies with regard to age; one important exception was in the area of language interventions. Otherwise, when age-level comparisons were possible, the large and significant effects of the interventions were obtained with 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.

Few interventions had evidence that their use resulted in improved conventional literacy skills or the precursor skills most related to later literacy growth, the exception being code-emphasis interventions. One reason that other interventions were not usually found to foster improvement in these measures is that few intervention studies with young children included such outcome measures. Code-focused programs, book sharing, parent/home programs, and language enhancement instruction all improved children's oral language skills; the preschool and kindergarten programs did not.

In most cases, the panel could not determine the role that child or family characteristics may play in inhibiting or amplifying the effectiveness of instructional interventions because of reporting limitations in the original studies. In general, however, variables such as age, socioeconomic status, and race/ethnicity did not seem to alter the effectiveness of the various interventions, and it will take future research to determine whether some interventions would prove to be ineffective with particular groups of children.

## Limitations

A major limitation confronting any meta-analysis is the availability of studies on a particular topic. Interventions or variables that have not been studied in ways that yield statistical effects cannot be summarized by a meta-analysis. Variables could not be included here unless they had been the focus of a correlational study linking them with later literacy. Similarly, the interventions had to have been the focus of past experimental study to be included here.

A second major limitation confronting meta-analyses is the quality of the original studies. All studies have varying degrees of weakness in their implementation and reporting. A basic premise of meta-analysis is that the collection of studies on a particular issue would be unlikely to suffer all the same problems and that the influence such factors may have on results can therefore be analyzed and understood. The reality is that the various study design features, demographic characteristics, and educational environments are often 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 the results only of published studies, it is possible that a somewhat different picture could be derived if a broader net were cast including doctoral dissertations and other nonrefereed reports. This is especially possible in those instances when conclusions were based on relatively few studies. In many cases, however, the number of studies summarized was large, and a sizeable body of research with findings different from those identified by the NELP's meta-analyses would be required to substantially alter conclusions.

In this case, many substantive issues of great concern to educators and parents could not be explored adequately because of limitations in the reporting of the original studies. There are many theories suggesting the likelihood of individual differences in instructional effectiveness that might be mediated by demographic characteristics. This meta-analysis evaluated whether variables such as race/ethnicity or socioeconomic status influenced the effectiveness of the interventions. Unfortunately, it was rare that the original studies provided sufficient data to allow unambiguous conclusions to be drawn. Many studies included diverse samples of children. However, few of these studies disaggregated results by characteristics of the population. Whereas inclusion of findings across heterogeneous samples of children provides some evidence for the generality of obtained effects, it does not allow specific tests of generalization of instructional effectiveness across groups.

## Future Research Directions

The NELP report provides a rich set of findings about the relationships among 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 should be addressed by future research.

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 variables. Future research must determine whether enhanced early instruction aimed at improving skills such as alphabet knowledge, 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 literacy skills, and one pattern that emerged was that the different categories of interventions had focused on qualitatively different outcomes. Code-focused interventions, for example, improved children's alphabet knowledge, phonological awareness, reading, and spelling skills, whereas shared reading interventions enhanced children's language development. It is possible that some of these interventions would actually have a wider impact, 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 use a wider range of outcome measures, it would be possible to determine the breadth of impact of these interventions. Also, given the complementary findings for the various types of intervention, it would be helpful if researchers undertook 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.

Not only is it important that multiple outcomes be considered in early literacy intervention research, but it also would be wise to employ a wider range of measures of particular skills. For example, reading to children was found to have a consistently positive impact on children's oral language development. This is a promising finding, but it should be noted that the practice was most often measured on vocabulary measures, and vocabulary measures had a very limited connection with later reading comprehension. It would be better to know what impact shared reading interventions had on reading comprehension, which is assessed by more complex and complete measures of language, as well as on conventional literacy measures themselves.

Finally, the NELP found few demographic differences in children's learning patterns and few differences in the effectiveness of variations in the major instructional practices that were examined. Rarely did these meta-analyses identify differences in effectiveness due to race/ethnicity, age, family income, or disability status, and when there were differences attributable to these variables they were often confounded with other features of the study. Similarly, researchers have many ideas about what mediates the effectiveness of any instructional procedure (e.g., dialogic reading vs. just reading in shared reading interventions; academic language presentation vs. play-oriented language interventions); however, few of these variations appeared to matter, although the effect sizes obtained in such analyses suggest that direct comparisons of these variables within sufficiently powered evaluation studies might have a different result. It is possible that what works in early literacy works for all children, no matter their status and background, or that many of the instructional variations valued by researchers do not matter much in effectiveness comparisons. However, it would be safer to draw these conclusions on the basis of direct empirical tests rather than meta-analysis.

## Conclusion

The NELP report represents a systematic and extensive synthesis of the published research literature concerning children's early literacy skills. It provides educators and policy makers with important information about the early skills that are implicated in later literacy learning, as well as information about the types of

instruction that have been found to enhance these skills. The results also identify areas where additional research is needed.

The meta-analyses conducted by the panel showed that several interventions had a positive impact on children's early literacy learning. Learning resulted from teaching children phonological awareness (with or without additional instruction on print-related skills), reading to them, involving parents in their children's learning, adopting literacy curricula in preschools and kindergartens, and teaching oral language skills. However, these positive results were mediated by the specific nature and intensity of the instructional interactions examined in the studies. Accordingly, there is a need for translational research to determine how these kinds of interventions could be offered effectively within typical early childhood education programs. Many of the interventions were delivered by researchers or research assistants, often under advantaged conditions, with the interventions delivered as one-on-one or small-group activities. It is evident from the studies that these kinds of teaching can improve young children's literacy skills but not whether such practices can be effective on scale under more ordinary circumstances. Although it is not unreasonable to focus on the effectiveness of particular activities in research studies, ultimately one would like to know of the pooled effectiveness of all of these positive practices: Can they be successfully and profitably combined within a preschool or home setting to maximize student progress?

Finally, there were significant problems with the quality of much of the research on early literacy instruction. Young children can change significantly in many areas of development over even brief periods. Nevertheless, many studies used simple pretest–posttest designs, with no comparison group, an approach that can provide no causally interpretable evidence because it is impossible to determine whether any gains were due to the instruction or to typical maturation. Even when group comparisons were made, there was often some question about the equivalence of the groups at the beginning of the study. Of course, if the groups do not start at similar levels, then it is impossible to attribute posttest differences to the teaching. And studies in which the intervention is confounded with other factors, such as teacher or preschool assignment, do not allow for unambiguous attributions of effectiveness. Building a sufficient knowledge base concerning early literacy skill development will require more high-quality research.

## REFERENCES

- August, D., & Shanahan, T. (Eds.). (2006). *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth*. Mahwah, NJ: Lawrence Erlbaum.
- Glass, G. V. (1976). Primary, secondary, and meta-analysis of research. *Educational Researcher*, 5(10), 3–8.
- Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing*, 2, 127–160.
- Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis* (2nd ed.). Thousand Oaks, CA: Sage.
- National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. Washington, DC: National Institute for Literacy. Available at <http://www.nifl.gov/earlychildhood/NELP/NELPreport.html>
- National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An*

- evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Pub. No. 00-4769). Washington, DC: U.S. Government Printing Office.
- National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel*. Washington, DC: U.S. Department of Education.
- Schoenfeld, A. H., & Pearson, P. D. (2009). The reading and math wars. In G. Sykes, B. Schneider, & D. N. Plank (Eds.), *Handbook of education policy research* (pp. 560–580). New York: Routledge.
- Shanahan, T. (2000). Research synthesis: Making sense of the accumulation of knowledge in reading. In M. L. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 209–228). Mahwah, NJ: Lawrence Erlbaum.
- Shanahan, T. (2005). Gaining perspective through science: A history of research synthesis in reading. In T. Trabasso, J. Sabatini, D. Massaro, & R. C. Calfee, (Eds.), *From orthography to pedagogy: Essays in honor of Richard L. Venezky* (pp. 193–211). Mahwah, NJ: Lawrence Erlbaum.
- Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
- Swanson, C. B., & Barlage, J. (2006). *Influence: A study of factors shaping education policy*. Washington, DC: Editorial Projects in Education.
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, 69, 848–872.

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Manuscript received January 11, 2010

Revision received February 12, 2010

Accepted February 25, 2010