

Child Care & Early Education

RESEARCH CONNECTIONS

LITERATURE REVIEW

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The Child Care Bureau (CCB) was created January 11, 1995, to provide a central focus for federal child care programs. CCB is dedicated to enhancing the quality, affordability, and availability of child care for all families.

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PROMOTING LANGUAGE AND LITERACY IN EARLY CHILDHOOD CARE AND EDUCATION SETTINGS

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What We Know

- ▶ Research findings suggest that a variety of targeted strategies succeed in improving children's language and literacy skills during the preschool years and beyond:
 - reading aloud to children in an interactive style (either one-on-one, or in small groups)
 - phonological skill development
 - increasing the amount and quality of environmental print in early childhood settings.
- ▶ Current research cannot help us determine which approach works the best or better than another. Studies indicate that there is not one approach that seems to work best for all children, but that various approaches can achieve positive results.
- ▶ Joint book reading is one activity that has been shown to promote language and literacy development across multiple domains—vocabulary growth, print awareness, enjoyment of reading, and even children's writing abilities.

INTRODUCTION

Although literacy development occurs throughout a lifetime, the early childhood years are crucial for laying a foundation for learning to read and write (Whitehurst & Lonigan, 2002). Studies have revealed stability from children's skills at school entry to later academic outcomes, and children who enter school with poor language and other pre-reading skills can have a hard time ever catching up (Kurdek & Sinclair, 2000; La Paro & Pianta, 2000; Reynolds & Bezruczko, 1993). Furthermore, experiences at home and in child care and other early childhood classroom settings contribute significantly to young children's language and emergent literacy abilities. Due to the pivotal role of children's early environments in the development of pre-reading abilities, it is important to consult the research on interventions and curricula that have been designed specifically to promote children's language and literacy development in child care and other early education settings. The analytical table accompanying this review summarizes findings from studies of such interventions. (www.childcareresearch.org/location/ccrca2797)

This literature review was designed to examine the existing research on promoting language and literacy development in early childhood care and education settings. It provides definitions of emergent literacy, summaries of important syntheses that have already been conducted, an overview of the current policy landscape, and the criteria used to select studies for review. It then provides a summary of key findings from the studies reviewed and tabled at the CCEERC website, as well as lessons gleaned from the research.

WHAT IS EMERGENT LITERACY?

Emergent literacy refers to the earliest signs of interest in and abilities related to reading and writing (Whitehurst & Lonigan, 1998). These early knowledge and skills are the precursors for the development of literacy; that is, they precede conventional reading and writing (Teale & Sulzby, 1986). Researchers in the field agree that emergent literacy is made up of several key components. One important component of emergent literacy is phonemic awareness, which is an understanding that speech is composed of units, such as words, syllables, and sounds, and the ability to perceive and manipulate the units of speech (Gunn, Simmons, & Kameenui, 2000). Phonemic awareness is part of a larger understanding of the sound patterns in a language, referred to as phonological awareness or phonological knowledge. Another important skill is knowledge of the letters of the alphabet and their corresponding sounds, often referred to as the alphabetic principle (Whitehurst & Lonigan, 1998). Awareness of print is also thought to be important and includes the understanding that print represents the meaning of a story, printed words correspond to spoken words, and print moves in a particular direction on a page—for instance, in English, print moves from left to right and top to bottom, while in Hebrew it moves from right to left and top to bottom (Gunn et al., 2000). Another component of emergent literacy is early writing development, evidenced in scribbling, producing letter-like forms and letter strings, and using “invented” spelling to attempt to write words (Richgels, 2002); (Teale & Sulzby, 1986; Whitehurst & Lonigan, 1998). Finally, oral language skills (e.g., vocabulary and an understanding of the uses and conventions of spoken language) are critical for learning to read (Whitehurst & Lonigan, 2002). Individually and collectively, these components of emergent literacy are related to later reading and academic success (Richgels, 2002; Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 2002).

BACKGROUND ON RESEARCH SYNTHESSES ON THE DEVELOPMENT OF LANGUAGE AND LITERACY

In recent years, several important syntheses of research on the development of language and literacy in early childhood have been conducted. In 1998, an important synthesis, *Preventing Reading Difficulties in Young Children*, was completed by the National Research Council of the National Academy of Sciences (Snow, Burns, & Griffin, 1998). The report contains recommendations for early interventions and instructional strategies for young children who are at risk of having problems learning to read, based on a review of the research literature. The National Research Council posits that to be effective, teachers should use a variety of strategies, and that a single approach might not be appropriate for all children. They provide recommendations for practices in preschool through third grade. Their main emphasis for child care and other preschool settings is that they should be rich in language and literacy activities. In particular, the authors emphasize the importance of activities designed to develop children's phonological awareness. Furthermore, children who are at risk for poor outcomes in language and literacy should be identified early and provided with additional support.

Also in 1998, the International Reading Association (IRA) and the National Association for the Education of Young Children (NAEYC) created a position statement on early literacy (*International Reading Association & National Association for the Education of Young Children, 1998*). The document makes recommendations for teaching practices that support the literacy development of children from birth through age 8. Recommendations were based on a review of the research as well as the "collective wisdom and experience" of the NAEYC and IRA membership; the position statement is in line with the recommendations of the National Research Council report (Snow, Burns, & Griffin, 1998). The authors state that children come from a wide variety of language and literacy backgrounds, so children vary greatly in their emergent literacy skills. No single teaching method or approach will work for all children, so teachers must employ a range of teaching

"...frequent reading aloud to and with children has been shown to lead to increases in multiple areas of literacy development, including vocabulary growth, print awareness, enjoyment of reading, and even children's writing abilities ..."

strategies. However, the single most important teaching strategy for children between birth and age 5 is reading aloud to children using a style that engages children as active participants. Other important strategies include fostering an understanding of print concepts, arranging the classroom in a way that encourages interaction with books as well as engagement in writing activities, and posting signs and labels throughout the classroom to enhance the "environmental print" available in the child care setting. In addition, teachers and care givers should develop children's understanding of the alphabetic principle and phonemic awareness.

More recently, a compendium of articles about emergent literacy has been published in the *Handbook of Early Literacy Research* (Neuman & Dickinson, 2002 a). This volume presents multidisciplinary perspectives on the most recent theory, research, and practice in the field of emergent literacy. Theoretical perspectives include cognitive, biological, and sociocultural models of literacy development. The research highlighted in this volume confirms that the preschool years play a critical role in children's literacy development. In particular, phonemic awareness is acknowledged as an important component for early reading, but multiple authors also identify oral language as important in facilitating both early reading and writing skills (Goswami, 2002; Watson, 2002). Several interventions are highlighted in the Handbook, including one-on-one tutoring or classroom-wide instruction in phonics, improving access to print materials, and providing multiple opportunities for using literacy materials in meaningful and engaging ways. However, the editors note that the interventions that have been tested tend to have a narrow focus on a particular component of

literacy development (e.g., phonics) and do not necessarily show lasting results (Neuman & Dickinson, 2002 b). Areas needing further research and theory development include the role of oral language and sociocultural context in the development of literacy among second-language learners (Neuman & Dickinson, 2002 b).

CURRENT POLICY LANDSCAPE

Early childhood education, particularly early literacy, is currently a major focus of the Bush administration. The administration developed an early childhood initiative called Good Start, Grow Smart to strengthen early learning opportunities and ensure that children enter school with the skills they need to succeed. The initiative has three components. The first is strengthening Head Start, including the development of a system of accountability to make sure that Head Start centers are meeting standards of learning in early literacy, language, and numeracy. The second component is helping states to improve the quality of child care and other early childhood education programs through the development of quality criteria and guidelines for emergent literacy and language activities. Under the Good Start, Grow Smart Initiative, the Child Care Bureau's task is to provide information, technical assistance, and leadership to support states in their effort to develop Child Care and Development Fund State Plans. Each of these plans should describe voluntary state early learning guidelines in language, literacy, and pre-reading skills that line up with current K-12 standards; professional development plans of early care and early education teachers, child care providers, and administrators; and the coordination of early childhood programs, in order to avoid service duplication and promote the improvement of children's learning during the transition from pre-kindergarten to elementary school. The third component is public awareness campaigns targeted to parents, child care providers, and other early childhood educators to provide information on early childhood development.

¹ See www.whitehouse.gov/infocus/earlychildhood/toc.html

Current Policy Context

Current policy initiatives incorporate early language and literacy as a central component:

- ▶ *Good Start, Grow Smart* intends to reinforce early learning opportunities and promote early school success through its efforts to:
 - strengthen Head Start by ensuring that centers meet standards of learning in early literacy, language, and numeracy
 - help states, in coordination with the Child Care Bureau, to develop Child Care and Development Fund State Plans describing voluntary quality criteria and guidelines for emergent literacy and language activities, professional development plans, and coordination of early childhood programs
 - conduct public awareness campaigns targeting parents, child care providers, and other early childhood educators to provide information on early childhood development
- ▶ *No Child Left Behind Act* is designed to help children read proficiently by the end of third grade, through two grant initiatives, *Reading First* and *Early Reading First*, which help educators implement research-based reading instruction during the early school and preschool years
- ▶ *Preschool Curriculum Evaluation Research Grants Program (PCER)* awards grants to support rigorous, random assignment evaluations of well-articulated, well-implemented preschool curricula

The tasks under this third component are mainly charged to the U.S. Department of Education and the National Institute of Child Health and Human Development (NICHD).¹

In addition, the No Child Left Behind Act (a revision of the Elementary and Secondary Education Act), signed into law in early 2002, includes two literacy components designed to help children read proficiently by the end of third grade—Reading First and Early Reading First (Kauerz, 2002). Reading First is designed to help schools implement well-researched reading programs/curricula for kindergarteners

through third graders and to help teachers provide effective early reading instruction. Early Reading First is targeted to preschool-age children. Grants are being given to early childhood education programs that attempt to foster emergent literacy through methods that have a strong research base (e.g., creating language and literacy-rich environments; professional development for child care providers; early language and literacy screening). The Early Reading First grants will use strategies that are research-based to compile effective practice information about providing quality language, literacy, and cognitive components that will foster later school success. The grant funds are provided to support local efforts to enhance these components, especially for low-income preschoolers and children with disabilities. Thirty grants were awarded in 2002; they ranged from \$782,330 to \$4,483,364 for a three-year project period.²

Related to these efforts, the U.S. Department of Education's Institute of Education Sciences (IES) has awarded grants under the Preschool Curriculum Evaluation Research Grants Program (PCER) in an effort to strengthen and improve the instructional content of the nation's preschool programs. The grants support rigorous, random assignment evaluations of well-articulated, well-implemented preschool curricula. Grantees are required to implement the curricula in the pre-kindergarten year, and follow children yearly through the end of first grade. Outcomes of interest include children's academic success in the areas of language development, pre-reading and pre-math skills, cognition, general knowledge, and social competence. In 2002, seven research grants were awarded, ranging from \$944,028 to \$3,105,597 for a four-year period; a new set of grants will be awarded through PCER in 2003.³

Given the current policy focus on language and literacy promotion for preschool-age children, the review of existing research on strategies to promote language and literacy in early childhood care and education settings is particularly relevant.

CRITERIA FOR SELECTION OF STUDIES FOR REVIEW

The aim of this literature review is to provide an overview of studies of programs/curricula designed to improve children's language or emergent literacy development in early childhood care and education settings. While the main focus of the review was interventions designed specifically to address children's language and/or literacy, also included are summaries of comprehensive early childhood interventions with a language/literacy component, including the High/Scope Perry Preschool Study, the Infant Health and Development Program, the Abecedarian Project, Early Head Start, and the Chicago Child Parent Center and Expansion Program.

The articles summarized do not represent an exhaustive list of research on this topic. In order to insure a uniform standard of rigorous research, we limited our focus to research published in peer-reviewed journals; book chapters and articles in non-peer reviewed journals were excluded. (We acknowledge that there is much promising research focused on promoting early literacy development in child care settings that has not yet appeared in peer-reviewed journals and thus was not included in this review; see, for example, the curricula under investigation as part of the PCER.) Other criteria for research quality, besides being accepted in a peer-reviewed journal, included an evaluation of the design of the study (i.e., it had to use systematic, empirical methods, either observational or experimental), the types of measures used (i.e., they had to produce valid data across evaluators or observers, and across multiple measurements), and the degree to which the data analyses addressed the hypotheses of the study and supported the stated conclusions. In addition, in order to be included in this review, a study had to report on child language or literacy outcomes; that is, studies were not included if they simply presented a description of an intervention or documented the effect of an intervention on classroom quality but did not address how

² See www.ed.gov/programs/earlyreading/index.html

³ See www.ed.gov/programs/edresearch/index.html

the intervention translated into child outcomes. The primary age range of the children in the studies was 3 to 5 years; studies of kindergartners or older children were excluded.

An attempt was made to find published studies of interventions in home-based child care settings, but none were found; therefore, the review only includes studies of interventions in formal child care and preschool settings. Several studies of interventions carried out outside of the United States are also included. Specifically, interventions in Canada, Australia and New Zealand are included here, primarily because they used strong research designs to test the effectiveness of preschool literacy interventions.

About 45 articles were initially identified for inclusion in this review. However, after further inspection, several articles were excluded based on one or more factors (e.g., not meeting the above-stated criteria—for example, having limitations in the research design or measurement instruments used; keeping the number of articles based on the comprehensive interventions to no more than two—one from an early point in the evaluation, and one from the most current point of evaluation that included language or literacy outcomes). In all, there are 26 articles represented in this review: 18 articles representing findings from targeted interventions to promote literacy in early childhood care and education settings, and 8 articles representing findings from comprehensive interventions with children ages 0 to 5. Additional information and detail about each study can be found in the analytical table accompanying this review. (www.childcareresearch.org/location/ccrca2797) As new research is published, the table will be updated to include the most recent information on techniques and curricula that promote language and literacy in early childhood care and education settings. That is, the table should be viewed as a “living document” that will be expanded as new research and findings emerge over time.

DESCRIPTION OF STUDIES

Targeted Intervention Studies

As noted above, the majority of studies reviewed involved an intervention designed specifically to enhance children’s language and literacy development. Nine of the studies involved reading aloud activities. In most cases, teachers were taught to read to groups of children using an interactive style (Lonigan & Whitehurst, 1998; Wasik & Bond, 2001; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994), or else a researcher or teacher read to each child individually (Morrow, 1988; Reese & Cox, 1999). Six studies involved activities designed to promote children’s phonological skills, such as rhyming activities or learning to identify objects that begin with certain sounds (Byrne & Fielding-Barnsley, 1991, 1993, 1995; Byrne, Fielding-Barnsley, & Ashley, 2000; Majsterek, Shorr, & Erion, 2000; Whitehurst, Epstein et al., 1994). Two studies involved altering the physical environment of classrooms to include an area rich in literacy materials and environmental print (Christie & Enz, 1992; Neuman & Roskos, 1993), and one study observed whether child care classrooms of varying quality with regard to their literacy environment affected children’s literacy and cognitive outcomes (Dunn, Beach, & Kontos, 1994). One program involved intensive training of caregivers in how to promote low-income Latino children’s emergent literacy (Yaden et al., 2000). In several of these studies, parents were coached in reading to their children in addition to the classroom intervention (Lonigan & Whitehurst, 1998; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994; Yaden et al., 2000).

All of the targeted language/literacy intervention studies reviewed were carried out with preschoolers who were between 3 and 5 years old. The length of the interventions varied widely, ranging from a few weeks to a full school year. The settings in which the studies were conducted also varied somewhat, but studies conducted in home-based child care settings were not found. The studies were conducted in center-based child care classrooms, Head Start classrooms, public pre-kindergartens, and other preschool

classrooms. Sample characteristics varied; most studies included children from low-income families while only one was conducted with children from higher-income families (Christie & Enz, 1992).

Comprehensive Intervention Studies

Five studies of comprehensive early childhood interventions (which aimed to improve multiple developmental outcomes) were included: the High/Scope Perry Preschool Study, the Infant Health and Development Program (IHDP), the Abecedarian Project, Early Head Start, and the Chicago Child Parent Center and Expansion Program (CPC). All of the programs included participation in high quality preschool settings (Liaw, Meisels, & Brooks-Gunn, 1995; Love et al., 2002; Ramey & Campbell, 1984; Reynolds, 1994; Weikart, Bond, & McNeil, 1978). Three of the programs started in infancy (IHDP, Early Head Start, and Abecedarian), while the other two started when children reached the age of three (High/Scope and the Chicago CPC program). The length of the interventions varied somewhat, but all lasted for at least two years. Most of the interventions also included additional services, such as home visits, parent support group meetings, pediatric check-ups, or referrals to community services. The programs were all targeted to high-risk children from low-income families. The majority of children in four of the five comprehensive intervention studies were African American (100% in Chicago CPC and High/Scope; 94% in Abecedarian; 53% in IHDP); the study of Early Head Start represented a balance of high-risk African American (33%), Hispanic (25%) and white (33%) children.

THEMES EMERGING ACROSS THE STUDIES

Promising Approaches to Promoting Children's Language and Literacy Development

The studies that examined the effectiveness of reading aloud to children in an interactive manner (e.g., the dialogic reading method, Whitehurst, Arnold et al., 1994) generally found this strategy to be successful in promoting emergent literacy skills among preschool-

age children. Specifically, interactive book reading in small groups generally improved children's vocabulary and print awareness, and in some cases, children's writing and other emergent literacy skills. Interactive book reading that occurred on an individual basis proved helpful in increasing vocabulary and print awareness in one study (Reese & Cox, 1999) and the number and complexity of children's responses to the book reading sessions in another (Morrow, 1988). Repetition of storybook reading and repeated questioning about novel words within the story were both helpful in promoting receptive and expressive vocabulary in yet another study (Senechal, 1997).

Those interventions that targeted children's phonological skills also had positive results, as did interventions that entailed adding literacy-rich areas to classrooms. Specifically, interventions that targeted phonological skills tended to improve children's phonological awareness, and in one case were found to improve decoding of words up to six years later (Byrne et al., 2000). Increasing the environmental print in preschool classrooms increased the likelihood of children engaging in literacy-related play activities (Neuman & Roskos, 1993), but some research suggests that adult involvement may be necessary to encourage children to incorporate literacy-related activities in dramatic play in addition to the increase in environmental print (Christie & Enz, 1992). The general quality of the child care classroom, as well as the specific literacy-related activities in the classroom, were found to predict children's language development (but not cognitive development) in one study (Dunn et al., 1994).

The one study that examined a multi-component strategy to teaching literacy to low-income Latino preschoolers found that the intervention was successful in increasing children's knowledge about English print, and children in the intervention outscored children from other preschool programs at kindergarten entry in their ability to identify upper- and lower-case English letters, as well as English vowels and consonants (Yaden et al., 2000).

In sum, a variety of targeted strategies were found to be successful at improving children's language and literacy skills during the preschool years

and beyond: reading aloud to children in an interactive style (either one-on-one, or in small groups), phonological skill development, and increasing the amount and quality of environmental print in the early childhood education setting. It is not possible to say which approach worked the best, or which worked better than another. As noted in the IRA/NAEYC position statement, more than one approach may be necessary to affect literacy improvements among all children. These studies illustrate that there is not one approach that seems to work best for all children, but that various approaches can achieve positive results. There is also some indication that combining effective approaches within a single intervention may be beneficial (Whitehurst, Epstein et al., 1994; Whitehurst et al., 1999; Yaden et al., 2000).

Comprehensive interventions that implemented high-quality child care and preschool programs tended to show stronger statistical effects on child outcomes than the targeted interventions, and the effects of the interventions typically endured for longer periods of time. For example, children who participated in the High/Scope Perry Preschool program scored significantly higher than control group children on measures of reading, arithmetic, and language through the fourth grade, and the magnitude of differences tended to increase over time (Weikert, Bond, & McNeil, 1978). One possible explanation of these differences between targeted and comprehensive interventions is that the comprehensive interventions usually lasted longer than targeted interventions; many of the targeted interventions in the studies reviewed were implemented for short periods of weeks or months. Thus, the effects may be a factor of the duration of the intervention, rather than the comprehensiveness, per se. Another possibility for the differences between findings from the comprehensive and targeted intervention studies is that the comprehensive studies exclusively included high-risk children from low-income families; perhaps there was more room for improvement among such children than there was among the more varied samples in the targeted interventions. Although comprehensive interventions have been found to be influential in promoting and sustaining positive academic outcomes, a disadvantage is that they are very

expensive, and they might not be the best approach to take if language and literacy are the only aspects of development one is trying to affect.

Dissipating Effects of Interventions

Literacy interventions of various types have documented short-term improvements in language and literacy skills. However, gains have generally not persisted into the elementary school years. For example, in an experimental study of the training of both parents and teachers in interactive reading techniques via videotape, combined with the implementation of a phonemic awareness curriculum in Head Start classrooms, Whitehurst et al. (1999) found effects lasting through the end of kindergarten, but not the end of first or second grade. Byrne, Fielding-Barnsley, and Ashley (2000) found “modest and intermittent” effects of their preschool phonemic awareness training to last through the end of fifth grade, but the effects were limited to decoding of words and did not extend to other literacy skills, such as spelling or comprehension. The authors suggest augmenting the phonemic awareness training with explicit training in word segmentation and sound blending during preschool in order to increase the likelihood of children developing into successful readers.

Interventions (both targeted and comprehensive) that last over an entire preschool year may have more chance of achieving long-term effects. Several authors note that the educational environments that children enter after preschool may have a considerable effect on the development of children’s literacy skills, which needs to be taken into account if one is looking at longitudinal effects of a preschool intervention (Reynolds, 1994; Whitehurst et al., 1999). It is likely that continued gains in literacy skills over the elementary school years requires ongoing exposure to a variety of literacy materials and high-quality learning opportunities.

Domain Specificity

As noted earlier, there are multiple skills involved in reaching conventional reading and writing. Some studies have aimed at strengthening one aspect of emergent literacy skills, yet it is not clear that proficiency in one area necessarily spills over into under-

standing or proficiency in another area of literacy development (Byrne et al., 2000). In particular, a lot of attention has been placed on promoting phonological awareness (i.e., understanding which sounds letters and combinations of letters make), because research indicates that phonological awareness is critical to literacy development (Gunn et al., 2000; Snow et al., 1998). However, the relative importance of different domains is not known; for example, semantic skills (i.e., understanding the meaning of words) may be as important to later reading development as phonological skills (Majsterek et al., 2000), or vocabulary growth may be central to later literacy (Dickinson & Sprague, 2002).

Currently, many of the studies that aim at improving phonological skills have concentrated their outcome analyses on measures of phonological awareness or decoding, or have examined the unique contribution of phonological awareness to literacy development, holding other factors constant (e.g., Byrne & Fielding-Barnsley, 1993). Understanding the extent to which interventions targeting one aspect of language/literacy development affect the development of other aspects of literacy development is an important issue for further research. Researchers have theorized that there is interdependence among the multiple components of literacy development (e.g., vocabulary, phonemic awareness, and print knowledge) and that they mutually reinforce each other in the process of achieving literacy. Furthermore, theorists have argued that there are mechanisms that establish interdependency between language and literacy skills early in development, and mechanisms that maintain this interdependency across development (Dickinson & Sprague, 2002). Further research is needed to test these hypotheses.

It should be noted that frequent reading aloud to and with children has been shown to lead to increases in multiple areas of literacy development, including vocabulary growth, print awareness, enjoyment of reading, and even children's writing abilities (see, for example, Morrow, 1988; Reese & Cox, 1999; and Whitehurst, Arnold et al., 1994). Consequently, joint book reading should be viewed as one activity that promotes language and literacy development across multiple domains.

METHODOLOGICAL ISSUES

Several methodological issues in the research on early childhood language and literacy interventions became apparent from the review of the literature.

Fidelity of Implementation

"Fidelity of implementation" refers to the extent to which all the intended components of an intervention are actually implemented as planned. If an intervention is not faithfully implemented as intended, the expected results may not be achieved. An example of a lack of fidelity to an intervention model is the failure to administer the intended dosage of the intervention. "Dosage" refers to the amount of intervention received within a given amount of time. Lack of parental and teacher compliance with the intended number (i.e., dosage) and quality of interactive book reading sessions were cited as reasons for less robust findings in several studies (Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994).

Duration Issues

"Duration" of an intervention means the length of time the intervention lasts. Analyses of the Chicago Child Parent Center and Expansion Program indicate that, at least for comprehensive interventions, intervening early in preschool and following up with services in kindergarten through third grade may provide the most benefit in terms of reading and math achievement in the later elementary school grades (Reynolds, 1994). That is, the longer the duration of the intervention, the stronger the results to be expected. However, duration and timing of the intervention can be confounded in many of these comprehensive early intervention studies (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002), making it hard to establish whether the length or the timing of the intervention is the most important factor. Nevertheless, it is the case that the comprehensive interventions lasted for several years, whereas many of the targeted interventions summarized here (and in more detail in the CCEERC tables) lasted a matter of weeks, rather than a full year or years. It is reasonable to question the type of lasting effects that

“... frequent reading aloud to and with children has been shown to lead to increases in multiple areas of literacy development, including vocabulary growth, print awareness, enjoyment of reading, and even children’s writing abilities ...”

should be expected from short-term literacy interventions, especially when fidelity to the model is not always achieved (Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994).

Dosage Issues

As mentioned above, dosage refers to the amount of intervention received. Several researchers have speculated that more intensive training of children with their intervention model would produce stronger and longer-lasting results. For example, Byrne, Fielding-Barnsley, and Ashley (2000) suggest that their model of providing seven hours of phonemic awareness training in preschool could be increased to improve long-term effects of the training.

Lack of Information on Psychometric Properties of Instruments

Of the 26 studies included in this review, 19 studies did not provide documentation on the reliability and/or validity of the measures used. Although the lack of information on reliability and validity of measures is problematic, it may simply connote a failure to convey information and not a problem with the measure itself. Indeed, many of these studies utilized well-established, standardized language measures, for which psychometric information on the standardization sample could be retrieved from other sources, if needed. However, even when standardized measures were used, only a few studies reported on how the instrument performed for their particular sample (e.g., Lonigan & Whitehurst, 1998; Morrow, 1988; Neuman & Roskos, 1993; Reynolds & Temple, 1998; Weikert, Bond, & McNeil, 1978; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994). Furthermore, studies conducted

outside the United States sometimes used instruments designed for American samples. It is not clear that the psychometric properties would hold across the populations, and no information on how the instruments functioned with these non-U.S. samples was provided. Future research on literacy interventions should provide more consistent reporting of measure characteristics in order to allow those who review the research to adequately evaluate the strength of the measures to capture the constructs being studied, and to adequately evaluate the outcomes of the study (for a more thorough discussion of child outcome measures in the study of child care, see (Zaslow et al., forthcoming).

Difficulty in Isolating the Effects of the Intervention

Even among studies that examine a single intervention strategy, there are often multiple components to the intervention, and the researchers have not analyzed their data in a way that would allow determination of which components of the intervention were responsible for positive outcomes. For example, Yaden et al. (2000) describe an intervention that has three components: providing a 2- to 3-hour morning language and literacy program in child care centers, providing in-class support and ongoing inservice training regarding emergent literacy to child care teachers and paraprofessionals, and establishing a book-lending library for families and offering periodic parent workshops on reading at home. While analyses indicated that Hispanic preschoolers participating in the intervention showed significant gains in their knowledge about print at the end of the year, and outscored comparison children (who did not have the intervention) on letter identification and vowel/consonant recognition in English at the beginning of the kindergarten year, it is impossible to know if all three components are needed to achieve these positive outcomes, or whether one or two of the three components would suffice. Similarly, Whitehurst and colleagues (Whitehurst, Epstein et al., 1994; Whitehurst et al., 1999) had two components to their intervention: videotaped training in dialogic reading (an interactive joint book-reading technique) for both parents and teachers, and the introduction of a phonemic awareness curriculum in the classrooms. Their findings of improved language

and emergent literacy skills among Head Start children who participated in the intervention were not analyzed in a manner that permitted a determination of whether the dialogic reading or the phonemic awareness curriculum (or both in combination) provided the basis for achieving these outcomes. Furthermore, it is not clear if training in dialogic reading for parents or teachers alone would have generated a similar effect size for child outcomes as did the joint training of both teachers and parents in this technique. The inability or failure of researchers to test the relative influence of the various components of their multi-component interventions makes it all the more difficult to determine what “works” to promote young children’s literacy skills in early childhood care and education settings.

Initial Differences Between Program and Comparison Group Children

Several studies noted initial differences in children’s literacy skills prior to the intervention. Some studies attempted to control for initial differences by analyzing change scores rather than raw or standardized scores (e.g., Majsterek, Schorr, & Erion, 2000). A limitation of examining change scores, however, is that they do not indicate the final level of performance, and thus there is no way to judge whether outcomes have surpassed a threshold of achievement. Other researchers addressed initial group differences by running additional post-hoc analyses based on the initial group differences, and found different patterns of results than were found when running analyses based on program/comparison group differences (e.g., Reese & Cox, 1999). The latter finding indicated that children with different initial strengths might benefit from different intervention strategies or different learning experiences. Still others used pre-test scores (which indicated a significant difference between groups) as covariates when examining differences in post-test scores across groups (e.g., Sénéchal, 1997). Initial group differences tended to be more common among non-random assignment studies. To the extent possible, it is important to account for initial group differences so that significant outcomes are not erroneously attributed to the intervention.

ISSUES NOT ADEQUATELY ADDRESSED IN THE CURRENT SET OF STUDIES

Successfully Working with Language Minority Children

The linguistic and cultural diversity of the early childhood population presents challenges to early childhood providers who are charged with developing emergent literacy skills in all children. Yet few of the studies reviewed included children who were not fluent in English. Addressing the needs of non-English speaking children is particularly important because this population has been growing rapidly in recent years, and will continue to grow in the future. Specifically, the number of children who speak a language other than English at home has more than doubled in recent years, from 5.1 million in 1980 to 10.6 million in 2000 (Fix & Passel, 2003). Furthermore, by 2015, it is expected that children of immigrants will constitute 30 percent of the nation’s school population (Fix & Passel, 2003). Research suggests that children with a primary language other than English are more likely to become fluent readers of English if they have a strong understanding of their primary language (IRA & NAEYC, 1998). The IRA/NAEYC recommendation is that children’s home language should be maintained as they are learning to speak and read English, and materials and resources in their primary language should be included in classrooms and activities whenever possible. Tabors (1997) suggests that teachers should provide a language-rich environment characterized by routine, plus a variety of modifications to organization and curriculum, that will help second language learners feel comfortable. If second language learners feel overwhelmed by the classroom social situation, they will be unable to engage fully in the language-learning process. Despite the importance of this issue, we were only able to identify one study that met our criteria that focused on improving the literacy development of non-English speaking preschoolers (Yaden et al., 2000). This is an area where more research is needed.

An important consideration for language minority populations is whether there might be differences resulting from culturally-based definitions of or ap-

Working with Language Minority Children

- ▶ Little research on early literacy and language has included children who are not fluent in English.
- ▶ Existing studies suggest that children with a primary language other than English are more likely to become fluent readers of English if they have a strong understanding of their primary language.
- ▶ The IRA and NAEYC recommend that children's home language be maintained as they are learning to speak and read English, and materials and resources in their primary language be included in classrooms and activities whenever possible.

proaches to literacy (Heath, 1983). For example, some research suggests that Spanish-speaking language learners should be introduced to vowels before consonants in beginning reading programs (Escamilla, 2000).

A related issue is the lack of fair and reliable assessments of language and literacy development for language minority children. In July 2003, an informal “think tank” was convened by SERVE, the National Prekindergarten Center, the National Institute for Early Education Research, and Dr. Sharon Lynn Kagan to discuss what is needed in the field to advance the development of better school readiness assessments for use with young language minority children. Hopefully, this consortium will help move the field forward on this important issue.

Successfully Implementing Interventions in Home-based Child Care Settings

As mentioned earlier, studies meeting our criteria conducted in home-based child care settings were not found. In fact, a search of the literature on family child care or other home-based care settings (including informal care by relatives, friends, and neighbors) did not turn up a single published article related to curricula or activities promoting language and literacy in young children. The literature that exists generally examines the quality of care provided in home-based settings (Burchinal, Howes, & Kontos, 2002; Kontos,

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Howes, & Galinsky, 1996; Norris, 2001; Pence & Goelman, 1991; Weaver, 2002) sometimes comparing it to the quality of care provided in center-based settings (Broberg, Wessells, Lamb, & Hwang, 1997; Clarke-Stewart, 1991). When children's language or literacy development were assessed as outcome variables, they were linked back to the quality of care provided in home-based settings more generally, rather than to specific practices carried out in those settings to promote language and literacy development (Broberg et al., 1997; NICHD Early Child Care Research Network, 2000).

Research on home-based care can sometimes collapse care by mothers and babysitters along with family child care providers (Clarke-Stewart, 1991), thus making the analysis of findings even less clear. What we do know from the literature is that parents can be taught to use an interactive book reading technique with their children (Whitehurst, Arnold, et al., 1994), so at least one type of literacy-promoting activity has been successfully implemented in home-based settings. In at least one study of family child care providers, the researchers found that providers who view themselves as professionals are more likely to provide high quality care to children, and high quality family care providers were more likely to report using appropriate activities with the children, including cognitively stimulating activities such as music listening, story time, outdoor play, word/letter games, puzzles and dramatic play (Pence & Goelman, 1991). Another study found that those family care providers who stayed continually involved in workshops throughout their tenure as caregivers showed higher quality care, including providing language and

“...there have been no systematic studies of the literacy of the early childhood workforce and its role in fostering the early learning environments that the nation’s political, economic, and education leaders are calling for so urgently.”

reasoning activities, than those who only intermittently participated in workshops (Norris, 2001). Taken together, this research suggests that family care providers who are professionally oriented may be more motivated to engage in training on promoting children’s literacy skills, and may also be more likely to make good use of such training.

Given the substantial proportion of young children in home-based care settings, it behooves the research community to devote more time and resources to examining the types of activities that can promote children’s language and literacy development in home-based settings. It is an empirical question whether the same techniques used in center-based settings would be as successful in home-based settings. The research suggests that caregiver characteristics such as professional orientation and motivation need to be taken into account when assessing the effectiveness of literacy interventions introduced in home-based settings. Conducting research in home-based settings is much more complicated and expensive to undertake than in center-based settings; nevertheless, this work is important and needs to be done.

The Literacy Level of Providers

There are additional caregiver characteristics that may affect children’s acquisition of emergent literacy skills in child care settings. In particular, providers who themselves have low literacy skills may have difficulty creating language-rich environments for children and implementing literacy curricula/techniques. As Deborah Phillips noted in a recent paper presented at the 2003 biennial meeting of the Society for Research in Child Development, “there have been no systematic studies of the literacy of the early

childhood workforce and its role in fostering the early learning environments that the nation’s political, economic, and education leaders are calling for so urgently” (Phillips, 2002).

In her presentation, Phillips (2002) reported on new analyses of approximately 100 licensed center- and home-based child care providers in Alameda County, California who were assessed on their English literacy abilities using the Tests of Applied Literacy Skills (TALS) as part of the Who Leaves, Who Stays Longitudinal Study. Analyses revealed that this cohort of providers scored slightly better than the national average on the literacy test (the average score was 296, compared to the national average of 267). However, nearly one-third of the sample (32%) scored within the “limited proficiency” range of the test, and none fell into the most proficient category. Further analyses investigated the associations between providers’ English literacy levels and a number of background characteristics, including the primary language of the provider. Results indicated that, controlling for other factors, three factors significantly predicted literacy levels: (1) having a primary language other than English, (2) race, and (3) wages. Specifically, non-English speaking providers, African-American and non-white, non-Hispanic providers, and providers with low wages all had significantly lower TALS scores. When examining center-based and home-based providers separately, analyses revealed that English literacy scores were significantly predicted by race and wages for center-based providers, and were significantly predicted by having a primary language other than English for home-based providers. Specifically, home-based providers whose primary language was not English had TALS scores 67 points lower than native English speaking home-based providers.

Additional analyses indicated that providers with higher English literacy scores (i.e., those scoring above “minimal literacy”) provided children with a wider selection of age-appropriate books and pre-reading activities, and spent more time reading and talking one-on-one with children than those providers with lower English literacy scores (i.e., those scoring in the “minimal” or lower literacy levels). Even after controlling for providers’ educational backgrounds, providers

with better English literacy skills provided higher-quality language and literacy environments for children in their care. These analyses suggest that caregivers' own English literacy skills are a significant factor in caregivers' ability to establish literacy-rich environments for children. Furthermore, these analyses point to a serious need to address the English language proficiency of home-based child care providers. Further research on larger, more nationally representative samples of child care providers is called for.

STUDIES TO WATCH FOR IN THE FUTURE

There are other promising interventions within early childhood care and education settings that were not included in this review or the CCEERC summary tables because the studies have not yet been published in peer reviewed journals. For example, the Literacy Environment Enrichment Program (LEEP) was recently developed by Dr. David Dickinson and colleagues, and is being used with Head Start programs in New England (Dickinson & Sprague, 2002). LEEP is a course, conducted with teams of teachers and their supervisors, which aims to help teachers use effective language and literacy practices. Teachers are trained to be more reflective about their practices, for example by audiotaping and analyzing their own conversations with children. The program was evaluated with a total of 30 teachers and a comparison group of 35 teachers. The researchers found that, in comparison to the no-intervention classrooms, LEEP improved overall classroom quality and teachers' attention to children's language and literacy, including the amount they read to children. They also found that changes in teacher ratings of children's language and literacy development were significantly greater in the intervention group than the comparison group. It should be noted, however, that using teacher ratings of children's literacy as an outcome measure when the intervention was used with those same teachers might result in biased outcome data. Nevertheless, this is promising research to watch.

Important research is also being conducted by the Center for Improving the Readiness of Children for Learning and Education (CIRCLE) at the University of Texas, Houston Health Science Center. Dr. Susan Landry summarized one research project and its findings at the White House Summit on Early Childhood Cognitive Development in July 2001 (Landry, 2001). The researchers developed a model of professional development for Head Start teachers in which teachers attend a four-day workshop on teaching language and literacy, and also take part in weekly in-class coaching sessions. They tested the model with 435 teachers, who participated for one year, and compared their progress to 210 teachers who did not receive the training. They found that teachers in the intervention group made greater gains over the course of the year than teachers in the comparison group in terms of oral language use, literacy activities, and effective book reading. In addition, children in the intervention classrooms made greater gains than children in the comparison classrooms on measures of phonological awareness, print concepts, letter knowledge, and receptive vocabulary. It will be important to monitor and review the findings once they are published.

Promising research related to language and literacy development is also currently being conducted through the Head Start Quality Research Consortium II (2001-2006). For example, Janet Fischel at the State University of New York at Stony Brook is leading a study to compare curricula that have the goal of enhancing children's emergent literacy and language skills in Head Start classrooms. The most promising curricula will be replicated in additional classrooms, and children from the project will be followed and assessed through early elementary school.⁴

In addition, as mentioned earlier, the Preschool Curriculum Evaluation Research Grants Program is also funding randomized evaluation studies of multiple preschool curricula; some are aimed at improving language and literacy skills of young children.⁵

⁴ See www.acf.dhhs.gov/programs/core/ongoing_research/qrc/partnerships_2001.html

⁵ See www.ed.gov/programs/edresearch/index.html

SUMMARY/CONCLUSION

Literacy skills start to emerge well before formal schooling begins. The quality of the language and literacy experiences that young children encounter at home and in their child care environments lay the groundwork for successfully achieving conventional reading and writing skills. Intervention research on activities and experiences that promote children's language and literacy development in child care settings is limited in number and scope. Even so, from the research summarized here (and in the CCEERC tables), we can conclude that a variety of strategies can be successful at promoting children's literacy skills; these include: engaging in interactive book reading, increasing the environmental print in the child care setting, and developing children's phonological skills. In addition, more comprehensive interventions that improve the quality of child care along with providing families with additional supports have proved to have long-lasting effects on children's cognitive and literacy skills in elementary school and beyond. Improving the overall quality of child care often means, among other things, providing literacy-rich environments, and engaging in book reading and one-on-one conversations. In essence, the elements that have proven to be effective in more targeted interventions to improve preschoolers' language and literacy skills have been important components of more comprehensive interventions. Nevertheless, the research does not permit us to conclude that one approach works better than another. However, there are indications that interventions that combine effective approaches may be most promising.

There are several factors that may influence the effectiveness of a literacy intervention. These factors include, but are not limited to, how closely the intervention model was followed during implementation; the intensity of the intervention and/or the length of time the intervention was continued; and various characteristics of providers, such as their professional orientation or their own literacy skills, which may affect the motivation or ability to improve the language and literacy environment in the child care setting.

We note several gaps in the current literature, which we hope will be addressed in future research. One area in need of further study is how to promote literacy skills among language minority children, as this is a growing subgroup of the American preschool population. Another area for future research is how to improve the English literacy skills of child care providers, many of whom have limited literacy skills, at least according to one recent study (Phillips, 2002). A related issue is the lack of research on home-based child care settings. There is a doubly important need to increase the amount and quality of research of home-based care settings, as some evidence suggests that many home-based providers do not speak English as their primary language, which may, in turn, affect the type and quality of literacy experiences they can provide to children in their care (Phillips, 2002).

As more research is generated, we hope that the picture of what promotes the language and literacy skills of children in child care settings becomes more clearly articulated for the full population of American preschoolers, and their care providers.

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