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Early Language and Reading Development of Bilingual Preschoolers From Low-Income Families

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Learning to read is a complex process and a number of factors affect a child's success in beginning reading. This complexity increases when a child's home language differs from that of the school and when the child comes from a home with limited economic resources. This article discusses factors that have been shown to contribute to children's success in early reading, namely—phonological awareness, letter–word identification, oral language, and the home literacy environment. Preliminary evidence suggests that bilingual children from low-income backgrounds initially perform poorly on phonological awareness and letter identification tasks, but appear to acquire these abilities quickly in kindergarten once these abilities are emphasized in early reading instruction. In addition, the findings show that bilingual preschoolers' receptive language abilities in English and Spanish positively impact their early letter–word identification abilities at the end of kindergarten. A positive relationship between bilingual preschoolers' home literacy environment and early reading outcomes has not been found to date. Educational implications for serving young, bilingual children from programs such as Head Start are discussed. **Key words:** *bilingual, early reading, Head Start, home literacy environment, letter knowledge, oral language, phonemic awareness, preschool*

LEARNING to read begins long before children receive formal instruction in elementary school (Burgess & Lonigan, 1998; NICHD Early Child Care Research Network, 2005; Whitehurst & Lonigan, 1998). Children are exposed to language and literacy events at home and preschool that support their reading development. They learn about print in the environment and the mechanics of print and begin to develop phonological awareness and knowledge of letters (Burgess & Lonigan, 1998). The process of learning to read, however, is more multifaceted when children's primary language is different from the oral and written language they encounter in school. This is the case for Spanish-speaking children, especially when their experiences are further complicated by living in economically disadvantaged homes (August & Hakuta, 1997).

Statistics from the U.S. Department of Education demonstrate that Latino children are at risk for poor literacy outcomes (National Center for Education Statistics, 2003). Specifically, data from the Early Childhood Longitudinal Study demonstrated that approximately 75% of Latino children entering kindergarten had one or more sociodemographic factors that placed them at risk for low achievement in reading (National Center for Education Statistics, 2003). In addition, 40% of Latino kindergarteners had reading abilities that were in the lowest quartile. This trend continues as children progress through school. Latino children have reading abilities below the mainstream population in Grades 4, 8, and 12 (U.S. Department of Education, 2000).

Circumstances associated with low-socioeconomic status, such as low maternal education, living on welfare, receiving food stamps, living in a home with a single parent, and having parents whose primary language is other than English, have been shown to negatively affect Latino children's English reading outcomes.

Because Latino children from homes with low-socioeconomic status are at greater risk for poor reading outcomes, it is important to understand children's reading development and factors that contribute to their reading outcomes. The goal of this article is to examine those factors and how they apply to bilingual development. To achieve this goal, we first review lessons learned from research on monolingual children's reading development. Next, using key factors identified in studies of monolingual children, we explore findings relative to those factors in research on reading development for bilingual children in general. Finally, we discuss the educational implications for young bilingual children growing up in poverty.

FACTORS CONTRIBUTING TO MONOLINGUAL CHILDREN'S EARLY READING ABILITIES

Few literacy development studies have been reported for Latino, bilingual children living in the United States, and, in particular, for preschool bilingual children. Therefore, the research on monolingual children serves as a primary resource. Thus, it is briefly summarized prior to the discussion of research on bilingual children.

Monolingual children's early reading development has been characterized as the acquisition of inside-out and outside-in skills (Whitehurst & Lonigan, 1998). *Inside-out skills* are those that do not require knowledge of the context, including phonemic awareness and letter knowledge. *Outside-in skills* relate to children's understanding of the context and involve language abilities that are supported by the home literacy environment (Speece, Ritchey, Cooper, Roth, & Schatschneider, 2004; Whitehurst & Lonigan, 1998). Research conducted over the past 15 years has investigated the contributions of both sets of factors to children's reading outcomes. Consensus has been achieved in some areas, whereas questions predominate in others.

With regard to inside-out skills, numerous studies have demonstrated that phonemic awareness is a powerful predictor of success in learning to read (Burgess & Lonigan, 1998; Lyon, 1995; Nation & Hulme, 1997; Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004; Ziegler & Goswami, 2005). That is, children who are able to focus on similarities among speech sounds, identify minimally paired words, or name things that begin with particular sounds are most likely to be successful during the beginning stages of reading (Bird, Bishop, & Freeman, 1995). On the other hand, children who lack these abilities are likely to struggle with reading. If children cannot distinguish among sounds and manipulate the sounds in spoken words, they will have a difficult time learning how to map speech sounds to letters (Adams, 1990; Bishop & Adams, 1990; Catts, 1991; Catts, Fey, Zhang, & Tomblin, 2001).

Evidence from studies of European languages, including English and Spanish, indicates that phonological awareness skills develop from larger units of words such as syllables and then progress to smaller segments (Goikoetxea, 2005; Goswami, 2001; Ziegler & Goswami, 2005). When beginning to read, some children may have developed abilities to segment words into syllables but not yet understand the concept of a phoneme. Later developing phonemic awareness abilities, such as the ability to move phonemes around in a word, are often learned after some formal reading instruction (Adams, 1990; Goikoetxea, 2005).

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Studies have also confirmed that children's early letter knowledge predicts their reading outcomes during elementary school (Lonigan, Burgess, & Anthony, 2000; Schatschneider et al., 2004; Wagner, Torgesen, & Rashotte, 1994). Knowledge of letter names is thought to be important, because "a beginning reader who does not know the letters of the alphabet cannot learn to which sounds those letters relate" (Whitehurst & Lonigan, 1998, p. 851). Knowing the names of some letters also provides information about the sounds that are associated with specific letters (Whitehurst & Lonigan, 1998). For example, the letter <t> (pronounced [ti]) is associated with the phoneme /t/, and the letter <k> (pronounced [keɪ]) is associated with the phoneme /k/. In addition, letter knowledge has been found to influence children's phonological sensitivity, which in turn affects children's reading abilities (cf. Bowey, 1994; Burgess & Lonigan, 1998; Stahl & Murray, 1994; Wagner et al., 1994, Whitehurst & Lonigan, 1998).

Inconsistent results, however, have been reported about the relationships between outside-in skills during the preschool years and later reading outcomes. With regard to oral language, most of the studies that have been conducted have identified either direct or indirect relationships between preschoolers' language abilities and later reading-related skills (for reviews, see Dickinson, McCabe, Anatasopoulos, Peisner-Feinberg, & Poe, 2003; McCardle, Scarborough, & Catts, 2001). For example, Dickinson and McCabe (2001) and Dickinson et al. (2003) identified a relationship between preschoolers' oral language abilities and their print concepts and knowledge, with vocabulary making a contribution to children's print knowledge that was equal to that of phonological awareness (Dickinson et al., 2003). Storch and Whitehurst (2001) observed an indirect relationship between children's oral language abilities and early decoding abilities, and a direct relationship later in development once children have established decoding abilities and reading comprehension plays a more important role (Storch & Whitehurst, 2001). The NICHD Early Child Care Research Network (2005) found that children's oral language abilities at age 3 were directly related to children's decoding abilities at 54 months, and that children's language abilities at 54 months were directly related to children's first-grade word recognition and indirectly related to third-grade reading comprehension.

However, the Head Start Family and Child Experiences Survey (Head Start FACES), which studied a large representative sample of Head Start children the year before the 4-year-old preschoolers entered school, concluded that children's receptive vocabulary at the end of Head Start, and gains made in vocabulary from fall to spring of the Head Start year, did not predict children's early decoding abilities at the end of kindergarten (U.S. Department of Health and Human Services, 2003). This result is somewhat consistent with the findings of Storch and Whitehurst (2001), who found an indirect as opposed to direct relationship between language and literacy outcomes in early grades. It should be noted that Head Start FACES did not examine the data for indirect relationships. Further investigations are needed to clarify this issue.

Turning to the home literacy environment, congruent evidence exists that the home literacy environment supports monolingual children's oral language development (cf. Beals, De Temple, & Dickinson, 1994; Burgess, Hecht, & Lonigan, 2002; Bus, van Ijzendorn, & Pelligrini, 1995; Payne, Whitehurst, & Angell, 1994; Speece et al. 2004; Whitehurst & Lonigan, 1998). Differing results, however, have been found with regard to the impact of the home literacy environment on children's reading outcomes. Some studies have revealed small or no relationship between the home literacy environment and literacy outcomes (Bus et al., 1995; Evans, Shaw, & Bell, 2000; Griffin & Morrison, 1997). Other researchers have found a direct relationship, particularly during the preschool years (Britto, 2001; Britto & Brookes-Gunn, 2001; Burgess et al., 2002; Scarborough, Dobrich, & Hager, 1991; Speece et al., 2004; Storch & Whitehurst, 2001). Differences in the measures and methods used in the various studies may explain some of the inconsistencies. Because of the differing findings, however, a firm conclusion cannot be reached about the effect of the home literacy environment during the preschool years on children's later reading abilities.

In summary, convergent evidence exists that inside-out skills (i.e., phonemic awareness and letter knowledge) impact children's later reading abilities. Divergent evidence exists regarding the impact of outside-in factors, such as oral language and the home literacy environment. On the basis of the current evidence, it appears that such outside-in factors may affect specific areas of reading development at differing times in children's development. Additional research, however, is required to resolve the existing questions about the contributions of these factors to reading. This is true for research on monolingual and bilingual populations, as will be demonstrated in the following section where research on bilingual children's early reading development is discussed.

FACTORS CONTRIBUTING TO BILINGUAL CHILDREN'S EARLY READING ABILITIES

The research that investigates inside-out and outside-in factors in Latino, bilingual children during the preschool years and the relationships between these factors and early reading outcomes of Spanish–English bilinguals is discussed in the following sections. As will be seen, relatively few investigations have been conducted that involve Latino bilingual children in the United States. Therefore, for some factors, studies do not exist that have investigated relationships to reading outcomes.

One of the best ways to investigate causal relationships among early predictors and longer term outcomes is to follow a group of children longitudinally. In each of the sections that follow, references are made to studies that we have conducted with colleagues. Because these studies are part of a larger longitudinal project, information about the sample is provided here to avoid repetition throughout article.

Eighty-three Spanish–English bilingual dren participated in our longitudinal inv gation of children's Spanish and English guage and literacy development during children's 2 years in Head Start through end of first grade. A subset of children wa lowed through second and third grades. current review focuses on results obta during the children's Head Start and kin garten years.

The children participating in this rese lived in urban areas in central Pennsylv and attended center-based Head Start grams that provided instruction in Eng Spanish was used in some classrooms or casion primarily for the purpose of clari tion. To participate in the investigation, dren had to be eligible to attend Head Star 2 years, be typically developing, pass a h ing screening, and have a mother who sp a Puerto Rican dialect of Spanish.

A primary purpose of the study wa investigate differences in children's deve ment depending on the timing of their posure to English. It was hypothesized the language and literacy development of dren who were exposed to English at h from birth would differ from children were not exposed to English until they tered school at age 3 (Butler & Hakuta, 2 Genesee, 2004; Oller & Eilers, 2002). Th fore, the participating children were div into two groups: Home English Commu tion (HEC) and School English Commu tion (SEC). Children in the HEC group been exposed to both English and Spanis the home from birth, whereas children in SEC group were exposed to Spanish in home from birth and were not expecte communicate in English on a regular basi til they began attending Head Start.

In the following sections, the result studies from our longitudinal investigatio integrated into a discussion of research has been conducted by others on inside and outside-in factors and Spanish–Eng bilingual children's reading abilities.

combined picture is then summarized to inform clinical decision making and to suggest areas ripe for further research

Research on inside-out factors with bilingual children

Phonological awareness

Unlike monolingual children, bilingual children utilize two linguistic systems. Results of empirical studies have shown that bilingual children may develop superior metalinguistic skills, that is, abilities to recognize, access, and manipulate components of words such as syllables, onsets, rimes, and segments that serve them well when learning to read, at least in related languages (Bialystok, 1986a, 1986b, 1988, 1991; Bialystok, Majumder, & Martin, 2003; Cromdal, 1999; López & Greenfield, 2004).

We hypothesized that bilingual children who acquire two languages from birth may be the more likely to develop superior phonological awareness abilities because of their experience attending to two different phonological systems. We reasoned that these experiences should assist them in extracting information from abstract linguistic structures. However, children whose home language experiences are different from the language of literacy instruction in the school or for whom the second language is used only in specific contexts would be less likely to have developed the analytic ability needed to understand abstract linguistic concepts in the second language.

Others have found that phonological awareness skills in bilingual children whose first language is not English may not follow the same developmental pattern of those of monolingual English-speaking children (Dickinson, McCabe, Clark-Chiarelli, & Wolf, 2004). Consequently, there may be a mismatch between the child's phonological system and that of the language of reading instruction. A kindergarten-age child, for example, whose primary language is Spanish might not yet recognize that a phoneme, such as /h/, which does not occur in Spanish, is used contrastively to signal meaning in English. To use /h/ as a phoneme would violate the phonological constraints of the child's first language. Once children are taught sound–letter correspondences, these differences should become more salient.

Studies testing hypotheses about the emergence of phonological awareness abilities in preschool-age Spanish–English bilingual children are just beginning to be reported. Dickinson et al. (2004) followed the growth of phonological awareness of one hundred twenty-three 3- and 4-year-old Head Start children from Spanish-speaking homes. Spanish and English phonological awareness abilities were measured in the fall and spring using the *Early Phonological Awareness Profile* (Dickinson & Chaney, 1997). This measure consists of two phonological sensitivity tasks: (a) a detection task in which the assessor directed a puppet to say words and the child decided whether the words were right (produced correctly) or wrong (initial or final phoneme was deleted), and (b) a rhyme recognition task where children were asked to identify words that had the same sound from pictures of three objects, of which two rhyme. Results showed that children with a high level of phonological awareness in one language also tended to have a high level of phonological awareness in the other language. Results of fall testing in both languages correlated with results of spring testing in both languages. The most important predictor of phonological awareness at the end of the school year in both languages was phonological awareness in the other language. These results showed that phonological awareness abilities in either language predict the co-occurrence of similar phonological awareness abilities in the other language.

As part of the longitudinal study described previously, Miccio, Hammer, Davison, and Scarpino (2006) investigated the phonological awareness abilities of Spanish–English bilingual Head Start children. Children's phonological awareness abilities were tested in a forced-choice picture task adapted from an instrument developed by Bird et al. (1995). Three abilities were examined in English and Spanish: Rhyme Matching (*What sounds like Dan?*), Onset Matching (*Which words start with the /p/ sound?*), and Onset Segmentation and Matching (*Which word starts with the same sound as Tom?*). The Spanish version also included First Syllable Matching (*Cuál empieza como Pedro? Pelo, capa, leche, o sol*). Subtests were combined, yielding possible raw scores of 25 in English and 30 in Spanish. Children were tested in the spring of their first year in Head Start and in the fall and spring of their second year in Head Start and in kindergarten. Comparisons were made between the abilities of children who were exposed to English and Spanish at home from birth (HEC) and children who were exposed to Spanish from birth and not expected to communicate in English on a regular basis until age 3 when they attended Head Start (SEC).

Results (Miccio et al., 2006) showed no significant differences in performance between the children from bilingual homes from birth (HEC) and those who were first expected to communicate in English in Head Start (SEC). Children showed very little understanding or ability to complete any of the phonological awareness tasks during Head Start (mean numbers correct in English and Spanish at the beginning of preschool were 7 and 11, respectively). Abilities in English showed a slight but continuous improvement through preschool to a mean of 11; however, Spanish abilities showed less improvement (mean score of 14 at the end of preschool). All children, however, performed well on all tasks early in the kindergarten year when the children's teachers began to explicitly teach phonological awareness in class (mean score of 20 in English and 25 in Spanish) and continued to improve in English (mean score of 23 at the end of kindergarten). Once children reached 5 years of age, the *Comprehensive Test of Phonological Processing* (Wagner, Torgesen, & Rashotte, 1999) was administered in the fall and spring of kindergarten and first grade. Results showed no differences between the groups in English phonological awareness, with standard scores ranging from 95 to 101 from the fall of the kindergarten year through the spring of first grade. Results indicated that once learned, phonological awareness skills were maintained in English, the language of instruction.

It is important to understand the phonological awareness abilities of bilingual preschoolers because these skills relate to early reading ability. In a study of beginning readers tested at the beginning and end of first grade, Durgunoglu, Nagy, and Hancin-Bhatt (1993) found that Spanish phonological awareness and word recognition abilities predicted English word reading. Children who performed well in Spanish performed well in English; children who performed more poorly in Spanish did so in English as well. In a similar study conducted with kindergarteners, Chiappe, Siegel, and Gottardo (2002) found that alphabetic knowledge and phonological processing abilities were the most important contributors to skilled early reading. These researchers found that neither bilingual children nor children learning English as a second language performed as well as native English speakers at the beginning of kindergarten on tasks assessing literacy and phonological and language processing, but that basic literacy skills developed in the same way across the three groups. In addition, data on the bilingual children in an investigation of Oller and Cobo-Lewis (2002) showed high correlations between phonological translation scores and reading.

These findings have been confirmed in other studies of bilingual phonological awareness in kindergarten and the primary grades. In a study of 249 Spanish-speaking English-language learners, Lindsey, Manis, and Bailey (2003) administered sound matching and sound categorization tasks in Spanish and English, and found that these abilities in Spanish co-occurred in English and the phonological awareness abilities predicted word-identification skills in the first grade. A follow-up study (Manis, Lindsey, & Bailey, 2004) of these children's emerging literacy skills showed Spanish and English

phonological awareness in kindergarten and first grade, respectively, to be predictors of reading ability in the second grade.

Taken together, these studies suggest a strong relationship between phonological awareness and early reading abilities in bilingual children in kindergarten and the primary grades. More research is needed regarding the relationship between early phonological awareness abilities in preschool children and reading abilities in the elementary years, particularly among children with different levels of exposure to and knowledge of the language of instruction. Results of current studies, however, suggest that children who hear English in their homes from birth have no particular advantage over children who are first exposed to English as the language of instruction in Head Start and similar programs.

Letter knowledge

Three studies have examined bilingual children's knowledge of letters during the preschool years. The first investigation was the Head Start FACES (U.S. Department of Health and Human Services, 2003). In this project, bilingual children who were considered proficient in English were assessed in English. Their results were grouped with those of monolingual English-speaking children. Children who were not proficient in English at the beginning of the school year and whose parents spoke Spanish in the home were tested in both Spanish and English. Both groups were assessed using the Letter–Word Identification subtests of the *Woodcock-Johnson Tests of Achievement* (Woodcock & Johnson, 1989). Results revealed that Spanish-speaking children began Head Start with English letter identification abilities that were slightly below monolinguals' abilities, and that Spanish-speaking children's Spanish letter identification abilities were two thirds of a standard deviation (*SD*) below the national norm. Children did not make gains in their Spanish or English abilities, as measured by standard scores, during the school year. Spanish-speaking children's abilities were comparable in the two languages. Children who were tested only in English began and exited Head Start with letter identification abilities that were one half of an *SD* below the national norm. No significant differences were identified between the monolingual and bilingual Head Start groups.

In addition, the Head Start FACES researchers (2003) estimated the number of letters known by the monolingual children (which included bilingual children who had proficiency in English) from the data from the Letter–Word Identification subtest. Children began Head Start knowing four letters on average and left the program knowing nine. Although this increase was significant, the Early Childhood Longitudinal Study of the Kindergarten Class of 1998 (ECLS-K; Zill & West, 2001) revealed that most children entering kindergarten in the United States knew the names of letters. Despite our best efforts, we have been unable to locate reports about just how many letter names the ECLS beginning kindergarteners knew. Even if the average child knew more than 9 letters, however, it could be concluded that monolingual (English) and bilingual (English–Spanish) Head Start children enter kindergarten with less knowledge of letter names than the majority of kindergarteners entering U.S. schools.

The second study was conducted by Tabors, Páez, and López (2003) on 344 bilingual preschoolers living in Massachusetts and Maryland who came from primarily low-income homes. Similar to the Head Start FACES results, Tabors et al. found that 4-year-old bilingual Head Start children performed slightly less than 1 *SD* below the mean on the Spanish Letter–Word Identification subtest of the *Woodcock Language Proficiency Battery—Revised* (*WLPB-R*; Woodcock & Muñoz-Sandoval, 1995) and two-thirds of a standard deviation below the mean on the English Letter–Word Identification subtest of the *WLPB-R*. As pointed out by Tabors et al., it is not surprising that bilingual children have skills that are behind those of monolinguals, given that bilingual children are developing reading abilities in two languages.

The third study of letter knowledge by bilingual children was conducted by our research team (Hammer, Lawrence, & Miccio, 2006a). We assessed children's abilities to recognize and name letters and to identify letter-sound correspondences using an investigator-developed instrument. Children were tested in the spring of their first year in Head Start and the fall and spring of their second Head Start year and kindergarten. Comparisons were made between the abilities of children with HEC and children with SEC. At the end of the children's first year in Head Start, no differences were observed between the HEC and SEC groups regarding their English letter knowledge, with both groups demonstrating minimal knowledge. The HEC and SEC groups had raw scores of 5 and 7, respectively, out of a possible total of 62 points. Both groups made slow progress during their second year of Head Start. By the end of Head Start, the HEC and SEC groups had mean scores of 19 and 21, respectively, which was not a significant difference. With regard to the children's Spanish letter knowledge, the HEC group had a raw score average of 6, whereas the SEC group averaged a raw score of 3. By the end of Head Start, the two groups averaged 12 and 9, respectively, and these scores were significantly lower than the English letter knowledge scores, indicating that the children made less progress in Spanish.

As noted previously, we followed these children through their kindergarten year. As reported by Hammer et al. (2006a), both groups made significant progress in letter knowledge during the fall and spring of their kindergarten year. By the end of kindergarten, the children's scores on the investigator-developed English measure had increased dramatically. Children scored 55 points, on average. Although the children also demonstrated increases in Spanish, their growth in Spanish was not comparable to their English development. Both groups averaged 35 on the Spanish measure. This result was not unexpected, given that Spanish literacy was not the goal of the Head Start or elementary schools that the children attended.

The findings of the three studies provide initial evidence that bilingual Head Start children begin kindergarten with letter knowledge that differs from the mainstream pop ulation of the United States. This appear to be true for monolingual English-speakin children who attended Head Start as wel suggesting that it is factors associated wit low-socioeconomic status, rather than bilir gualism, that place bilingual Head Start chi dren at a disadvantage when they ente school. A more hopeful picture comes fron our investigation (Hammer et al., 2006a) in which we found that bilingual childre were able to make great gains in thei letter knowledge during the kindergarte year.

These results also need to be interpreted i the context of what is known about readin development by monolingual children learn ing to read in their oral language. As note earlier, studies of monolingual childre demonstrate that children's letter knowl edge contributes to their reading outcomes Although one would predict that this pre dictive relationship would hold for bilingua preschoolers, investigations are needed t establish whether a relationship betwee letter knowledge and later reading abilitie exists for bilingual preschoolers as well These studies are yet to be conducted.

Research on outside-in factors with bilingual children

Oral language

Only a few studies have investigated the re lationships between the oral language abilitie and reading outcomes of bilingual Spanish-English preschoolers. In the investigation re ported by Hammer, Lawrence, and Miccio (2006b), we asked whether bilingual chil dren's abilities to identify letters and word at the end of kindergarten were related t the children's overall receptive language abili ties during Head Start. The oral language abil ities of children in the HEC and SEC group were tested in the fall and spring of chil dren's 2 years in Head Start. Children's En glish language abilities were assessed with the *Peabody Picture Vocabulary Test-III* (Dunn & Dunn, 1997) and the Receptive Comprehen sion subtest of the *Test of Early Language*

Development-3 (Hresko, Reid, & Hammill, 1999). Their Spanish language abilities were evaluated using the *Test de vocabulario en imágenes Peabody* (Dunn, Lugo, Padilla, & Dunn, 1986) and the Auditory Comprehension subtest of the *Preschool Language Scale-3* (Spanish ed.) (Zimmerman, Steiner, & Pond, 1992). Component scores were created by summing children's raw scores on the two measures per language. Children's abilities to identify letters and words were assessed at the end of kindergarten using the Spanish and English Letter-Word Identification subtests of the *WLPB-R*. Growth curve analyses were performed to investigate children's language development and the predictive relationships between language and early reading outcomes.

The results of these analyses (Hammer et al., 2006b) revealed that the children's letter–word identification abilities were at the test mean in English at the end of kindergarten, with no differences between the HEC and SEC groups. Both groups of children had Spanish letter–word identification abilities that were close to 1 *SD* below the test mean. With regard to children's receptive language development, children's abilities in Spanish and English increased over time. Children in the HEC group had higher English language skills at the beginning of Head Start than children in the SEC group, although the two groups' abilities increased at the same rate during the 2-year period. Children in the SEC group had higher Spanish scores during fall of their first Head Start year than children in the HEC group. In addition, the receptive language abilities of children in the SEC group increased at a faster rate than children in the HEC group. Regarding the relationship between language and reading abilities, Hammer et al. found that the rate of change of children's English and Spanish language abilities predicted their English and Spanish letter–word abilities, respectively. This is consistent with the results of Lindsey et al. (2003) who found that the English and Spanish letter–word identification abilities of bilingual first graders, who received instruction in both Spanish and English, were predicted by their English and Spanish expressive vocabulary abilities in kindergarten, respectively.

Thus, initial evidence demonstrates that bilingual preschoolers' English language abilities predict their letter–word identification abilities in kindergarten, similar to findings on slightly older bilingual populations. More information is needed in this area. In particular, studies are needed that examine these relationships in children who have received early instruction in differing language environments, such as English only and bilingual instructional contexts.

Home literacy environment

The home literacy environment of Spanish–English bilingual preschoolers and its relationship to children's early reading abilities have received limited attention in the literature. Our review identified only one study that investigated this relationship in Spanish–English bilingual preschoolers. It was contributed by our research team as part of the longitudinal investigation described previously.

Hammer, Miccio, and Wagstaff (2003) examined the home literacy experiences of a subset of bilingual children who participated in our larger study. Home visits were completed by bilingual investigators with mothers of 43 children during the first year of Head Start. As part of the home visit, mothers were asked to provide information about the frequency with which they engaged in various literacy activities (e.g., reading a book, reading a magazine, writing a letter); taught their children early literacy-related skills (e.g., taught their children the names of letters and the sounds that go with letters, taught their children to write); and read books to their children. In addition, they were asked about the number of books for children and adults that they had in their home. Comparisons were made between the home literacy environments of children with HEC and SEC, and relationships among the four aspects of the home literacy environment and children's early reading abilities were examined.

In this study, Hammer et al. (2003) found no differences between the home literacy environment of the HEC and SEC groups with regard to how frequently mothers engaged in literacy activities, how frequently mothers read books to their children, and how many books were in the home. Both groups of mothers engaged in literacy events slightly more than once a month and read to their children several times a week, on average. Mothers reported an average of less than 10 books in the home. The two groups did differ with regard to how frequently the mothers taught their children literacy-related skills. Mothers in the HEC group reported engaging in teaching activities once a week as opposed to the mothers of the SEC group who reported teaching their children a few times a month. Significant relationships were not found among the reported frequency of mother and mother–child literacy activities, the availability of books in the home, and children's early reading abilities, as measured by the *Test of Early Reading Ability-2* (Reid, Hresko, & Hammill, 1991). It is possible that the availability of materials and frequency of literacy activities were not sufficient to affect children's literacy outcomes, accounting for the finding of no relationship. It should be noted out, however, that this finding is consistent with several investigations that have been conducted on monolingual populations, which found either no or weak relationships between the home literacy environment and early reading outcomes (cf. Bus et al., 1995; Evans et al., 2000).

Summary of research findings

The research on bilingual populations from low-income backgrounds reviewed in this article has provided some initial information on inside-out and outside-in factors that may impact bilingual children's reading development (Whitehurst & Lonigan, 1998). Research findings have shown that bilingual children from low-income backgrounds perform poorly on phonological awareness tasks in preschool but appear to acquire them quickly once they are in kindergarten where onset-rime and phonemic segmentation tasks are emphasized in early reading instruction. This is clearly important because phonological awareness abilities, particularly abilities that require manipulation of phonemes, predict reading ability in the primary grades.

Research on children's early letter knowledge has demonstrated that children from low-income backgrounds appear to begin school with less knowledge of letter names and sounds than children who are of middle-socioeconomic status. An initial finding on children's oral language indicates that the English and Spanish language abilities of children who received instruction in English during Head Start positively impact children's early reading abilities in English and Spanish in kindergarten. Evidence was not found, however, that home literacy environment, as reported by parents during Head Start home visits, has an impact on children's emergent literacy skills. The reader must recall that research in these areas is relatively new and that additional evidence is needed before firm conclusions can be reached.

IMPLICATIONS FOR PRACTICE

The discussion of the literature on bilingual preschoolers' language and literacy development clearly demonstrates that more research is needed on the language and literacy development of Spanish–English bilingual children who are living in the United States and on factors that impact children's early reading development. As noted, few studies have been conducted in each of the areas that have been reviewed. In particular, studies are needed that extend beyond low-income populations so that an understanding of the impact of factors related to bilingualism and factors related to socioeconomic status can be understood. Also, minimal attention has been given to the role of instruction in children's development. Therefore, studies that focus on preschoolers' language and literacy development within different educational contexts would be beneficial. It is likely that children's reading outcomes in English and Spanish differ

depending on whether they are provided instruction primarily in English, primarily in Spanish, or in both languages.

Despite these limitations, the current research has implications for working with bilingual preschoolers. We begin by discussing two broader implications and then focus on implications related to each of the specific areas of development targeted in the article.

Broad implications for assessment in both languages

A primary issue to keep in mind when working with or assessing young bilingual children is the timing of exposure to English in relationship to school entry. Preliminary evidence suggests that the language development of children who are exposed to English on a regular basis from birth differs from the language development of children who were not expected to communicate in English until school entry (Hammer et al., 2006b; Oller & Eilers, 2002). Therefore, speech-language pathologists and educators need to gather background information on children's exposure to the two languages, particularly when making diagnostic decisions (Miccio, Hammer, & Toribio, 2002). Such information will help with the interpretation of the testing results.

Children who have not been exposed to English before attending school need to be given time to learn English. As noted by Cummins (1981), it takes bilingual children 2 to 3 years to "catch up" to their monolingual counterparts in conversational tasks and 5 to 7 years to develop their academic abilities in a second language. Children who have been exposed to both languages at home are likely to have abilities in Spanish and English that differ from monolingual speakers of the two languages as well. Therefore, bilingual children should not be compared with monolingual children, and variations in development should be expected among bilingual children because of the differing amounts of exposure to the two languages that children have received (Genesee, Paradis, & Crago, 2004).

Related to the previous point, because bilingual children will have had exposure to two languages to varying degrees, it is essential that children's development be assessed in both languages. Knowledge of a child's entire language and literacy system is needed in order to make proper diagnostic decisions. Although a global discussion of the decision-making process when evaluating bilingual children is beyond the scope of this article (see Goldstein, 2006), a discussion of the implications of research in each of the developmental areas that were targeted in the article will inform speech-language pathologists' and early childhood educators' work with bilingual children.

Implications for phonological awareness

When assessing bilingual children's phonological awareness abilities, speech-language pathologists and educators must be aware that phonological awareness tasks used in testing are often chosen to exploit the similarities between two languages rather than call attention to the differences. One-syllable words with CVC shapes, for example, are used to test awareness of onset-rime. Items like "dog" in English and "sol" in Spanish are used, and children separate the onset from the rime by saying "d-og" and "s-ol." Common two-syllable CVCV constructions used in Spanish, however, are often ignored, for example, segmenting the syllable onsets from the rimes in "casa" would require the child to segment "c-a-s-a." When presented with this task, children tend to say "c-asa," indicating they understand how to segment the word-onsets from the remainder of the word but they do not necessarily demonstrate knowledge of onset-rime within a syllable. Consequently, children from Spanish-speaking homes who may not have the ability to analyze English syllables into smaller phonological units may still perform well on a phonological awareness measure that uses one-syllable words with codas (CVC). They may struggle with other aspects of learning to read, particularly when the rules of the first language are violated. This is most likely to occur when the speech sounds that are phonemes in English are variants of phonemes in Spanish or may not be permitted to occur in certain syllable structures in Spanish.

In addition, the frequency of occurrence of syllabic types and rhythmic patterns of Spanish differ from those of English (Whitley, 2002). Consequently, Spanish-speaking or sequentially bilingual children may be at a disadvantage because of differences in allophonic variation between their first language and that of the language of reading. In any event, the possibility of problems in this area increases when children are faced with decoding tasks in a language of which they have only superficial knowledge. Direct teaching of phonemic segmentation tasks will assist bilingual children in the early stages of learning to read.

Implications for letter knowledge

With regard to children's letter knowledge, the evidence that was presented indicates that many bilingual (and monolingual) children from low-income backgrounds begin and end Head Start with letter knowledge that is relatively limited (U.S. Department of Health and Human Services, 2003; Hammer et al., 2006a). When interpreting these results, it should be noted that these data were collected prior to the implementation of the current Head Start performance standards that emphasize children's literacy development. Perhaps, more deliberate instruction associated with the standards will lead to different results in future studies. Support for such a hypothesis came from the preliminary evidence presented by Hammer et al. (2006a), which showed that children made great gains in their letter knowledge during kindergarten. Therefore, it is possible that Head Start children's limited knowledge of letters may be due not to being bilingual but to the limited emphasis on letter knowledge they had received in Head Start during this time period.

Therefore, when assessing a bilingual child's letter knowledge at the beginning of kindergarten, it is important to determine whether or not the children have been exposed to letter names during their preschool years. Children who do not have knowledge of letters are thought to be at risk for poor literacy outcomes. It may be, however, that children who have had minimal exposure to letter names during preschool may be at less risk compared with those who have received more extensive exposure but still have limited knowledge of letters at kindergarten entry. In other words, children in the group who have been exposed to instruction but have not learned the letter names may have a higher risk for disorder that impacts their learning ability. These are those children who may be in need of special services to support learning, whereas those not yet exposed may need more intensive general education instruction.

Implications for oral language

The research by Hammer et al. (2006b) and Oller and Eilers (2002) on the oral language development of bilingual children supports the argument that the timing of exposure to English in relation to school entry impacts their development. When focusing on bilingual preschoolers, Hammer et al. (2006b) demonstrated that children with HEC had higher initial overall English receptive language abilities than children who did not experience English communication (SEC) until school entry. In addition, children with SEC had higher overall Spanish receptive language abilities when then started Head Start than did children with HEC. These differences continued over the 2 years children attended Head Start. As indicated previously, we have followed these children beyond Head Start. Ongoing analyses will allow us to determine whether these differences remain over time.

Similar to several research findings on monolingual children, children's English language development during Head Start predicted the children's letter–word identification abilities at the end of kindergarten (cf. Dickinson & McCabe, 2001; Dickinson et al., 2003). Also, in keeping with the findings of

Lindsey et al. (2003), Hammer et al. (2006b) identified a relationship between children's Spanish language abilities and early reading outcomes. This early evidence suggests that knowing Spanish does not negatively impact children's abilities in English. This implication is highlighted here, because many parents of bilingual children are told not to speak the family's native language to their children. This is because some believe that knowledge of a language other than English negatively impacts children's abilities in English. Although research is needed that specifically addresses this issue, there is currently no support for an assumption that speaking Spanish at home has a negative impact on English language or literacy learning. On the other hand, we believe it is a safe assumption that parents can provide children with the richest language and literacy experiences in the language in which they have the most proficiency. There are many reasons to encourage active parent–child communication beyond its potential to support children's literacy development.

Implications for the home literacy environment

The initial findings on the home literacy environment of bilingual children (Hammer et al., 2003) are consistent with other research on low-income children that demonstrates that children from low-income families experience a lower frequency of literacy-related activities in the home than do children from middle-income families. Given that home literacy activities have been shown to support language development and may contribute to early reading outcomes, efforts to assist families to increase their children's exposure to literacy-related events seem warranted. Caution should be applied, however, to make certain that professionals' efforts supplement rather than supplant the cultural styles of interaction that may occur around language and literacy events (cf. Hammer, Nimmo, Cohen, Draheim, & Johnson, 2005; Janes & Kermani, 2001; McNaughton, 2001).

CONCLUSIONS

In summary, this article provides an overview of the findings of a number of studies that have investigated the relationship of inside-out and outside-in skills to beginning reading abilities. These studies have shown that the relationships between phonological awareness and letter–word identification and later reading in monolingual children are also evident in bilingual children. Results concerning outside-in oral language and home environment skills are less consistent. Research on bilingual children has shown that early language abilities predict early reading abilities, whereas the home literacy environment of bilingual children from low-income homes (as measured by parent report) does not.

More research is needed to better understand the relationships among inside-out and outside-in skills and the early reading outcomes of bilingual, Latino children. In particular, longitudinal investigations are needed that examine whether these relationships change as children's reading abilities develop throughout elementary school. In addition, more efforts must be made to develop assessment instruments that meet the particular needs of bilingual children. These instruments can then be employed in investigations of bilingual children's development, and can be used by speech–language pathologists and educators when assessing the abilities of bilingual children who may be in need of services.

Finally, early intervention studies are needed to determine whether targeting inside-out and outside-in skills in the child's first and/or second language increases overall abilities later in school. In particular, these studies need to document differences among students in different instructional contexts, for example, those in English immersion in contrast to children in dual-language programs. Careful attention should also be paid to the effects of intervention on maintenance of bilingualism to determine the best educational setting for positive long-term outcomes in two languages.

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