

Phonological Awareness and Bilingual Preschoolers: Should We Teach It and, If So, How?

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This article briefly reviews recent research on teaching phonological awareness skills to preschoolers as well as the benefits of different types of bilingual education. A more in-depth analysis of research on cross-language transfer of phonological awareness/metalinguistic skills follows. The major recommendation resulting from this review is that the teaching of phonological awareness skills in both the home language and school language of preschoolers is the preferred intervention.

KEY WORDS: bilingual education; bilingual students; metalinguistics; preschool curriculum; preschoolers; reading problems; reading readiness.

INTRODUCTION

Bilingual children receive special education services at a considerably higher rate per capita than monolingual children in this country (Garcia, 1993). Many of these referrals are for academic, usually reading, problems which are presumed to factor into the approximate 40% high school drop-out rate for bilingual students (Garcia, 1993). Today, there is rising agreement among researchers that there are interventions that demonstrably aid preschoolers in becoming literate. This article reviews what some of those interventions are and how they can be used with bilingual preschoolers.

There has been a longstanding debate in the teaching of reading whether phonics or whole language approaches are more beneficial in supporting the young child's growth into literacy. In a comprehensive book-length review of the extensive literature on this subject for the National Research Council, Snow, Burns, and Griffin (1999) conclude that good literacy programs must include both enriched literary environments and direct instruction in sound-symbol correspondence. There are also recently published neuroimaging studies, to be discussed later, that have documented neurological differ-

ences between normal and slow readers, identifiable cross-culturally, that are related to phonological awareness (Paulesu et al., 2001). It is increasingly clear that the development of literacy and preliteracy skills should include the teaching of phonological awareness and sound-symbol correspondence, and particularly so for students at-risk for reading problems. As Bialystok and Herman (1999) state, "If there is anything like consensus in the literature examining the preparatory skills for reading in an alphabetic script, it is that the development of children's phonological awareness is essential" (p. 39).

This article specifically focuses on the questions regarding the teaching of phonological awareness to bilingual preschoolers. It begins with a review of research on phonological awareness in the education of preschoolers and on the education of bilingual young children. An analysis of the research on cross-language transfer of phonological awareness follows, and the article concludes with recommendations regarding the instruction of bilingual preschoolers in phonological awareness.

PHONOLOGICAL AWARENESS

Over the past 25 years, a number of studies have demonstrated the significance of phonological awareness in helping young children to develop preliteracy and literacy skills. These studies have been examined in several reviews (Beitchman & Young, 1997; Chard &

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Dickson, 1999; Nicholson, 1999). Some controversy has remained about whether phonological awareness is causally related to reading proficiency (Blachman, 1991; Bryant, Maclean, & Bradley, 1990; Byrne & Fielding-Barnsley, 1995; Maclean, Bryant, & Bradley, 1987), or whether the relationship is reciprocally reinforcing (Bialystok & Herman, 1999; Oller, Cobo-Lewis, & Eilers, 1998). Phonological awareness can be defined as “explicit awareness of the phonological structure of the words in one’s language” (Torgesen, Wagner, & Rashotte, 1994, p. 276). Phonemic awareness is a more sophisticated skill and can be defined as “the ability to manipulate phonemes either by segmenting, blending, or changing individual phonemes within words to create new words” (Chard & Dickson, 1999, p. 262). The literature has generally distinguished between preschoolers, believed capable of phonological but not phonemic awareness, and early elementary school students who develop phonemic awareness (Chard & Dickson, 1999).

The research literature also mentions other cognitive factors that may be important in the development of reading skills. Naming speed, that is, the ability to retrieve the names of things quickly, is one such candidate (Beitchman & Young, 1997; Blachman, 1994). Lonigan et al., (1999) believe that the correlation of slow naming speed/lexical access to reading problems is really a manifestation of attentional disorders. Although this is an area of ongoing research, a factor-analytic review of longitudinal studies reports that these other factors are not nearly as significant in establishing reading skills as phonological and phonemic awareness (Torgesen et al., 1994). Indeed, Good (1998) reports that kindergarten phonological awareness test results account for 53% of the variance of Grade 1 reading scores.

Paulesu et al. (2001) used positron emission tomography to study the brain activity of Italian, French, and English dyslexic and nondyslexic adults while reading. The researchers confirmed the results of other neuroimaging studies and found that, compared to controls, dyslexics of all three nationalities showed reduced activity in an area of the left temporal lobe while reading. The research team concluded that “a phonological processing deficit is a universal problem in dyslexia” (p. 2167).

A problem for the Paulesu group (2001) was that dyslexia is diagnosed in Italy much less often than in France or England. They were able to identify Italian dyslexics by self-report of reading problems and differences from controls on reading and phonological tests. They theorize that languages with shallow orthographies—that is, speech sounds are always represented by

the same combination of letters—create fewer reading problems for dyslexics than languages with deep orthographies—in which speech sounds can be represented by many different combinations of letters.

Preschoolers’ Phonological Skills

Many researchers believe that preschoolers who have underdeveloped skills in phonological awareness are at risk to develop reading difficulties in early elementary school (Blachman, 1991; Lundberg, Frost, & Peterson, 1988; Nicholson, 1999). Interventions specifically designed to increase phonological awareness in these preschoolers have, in follow-up studies, increased their reading skills as kindergartners, first- and second-graders (Byrne & Fielding-Barnsley, 1991, 1993, 1995).

There is general agreement regarding the progressive development of phonological awareness: once children recognize that words are distinct from each other, they then start to recognize that some words rhyme, then begin to hear that words have divisible syllables, then that onset (the initial sound of a word) and rime (the terminal sound, the rhyming part, of a word) occur, and finally to distinguish phonemes (Castle, 1999; Chard & Dickson, 1999; Nicholson, 1999).

In a study of 3-year-old children, Maclean et al. (1987) found that a significant percentage could detect and produce rhyme and onset, but only a few could segment words, syllables, or phonemes. Two replication studies of the Maclean group’s study have been done, one with 4 year-olds (Fernandez-Fein & Baker, 1997) and another with 2-to 5 year-olds (Lonigan, Burgess, Anthony, & Barker, 1998). These studies also looked at class, parental education, and the child’s knowledge of nursery rhymes. Both studies confirmed that a significant percentage of preschoolers were able to detect and produce rhyme and onset. Rhyme detection was the easiest task for the children; some 2-year-olds were able to do so. By the age of 5, most of the middle-income children could do this, and about half could detect onset.

After regression analysis, both Lonigan et al. (1998) and Fernandez-Fein and Baker (1997) found that socioeconomic status (SES) and maternal education were significantly correlated to the level of phonological awareness of the child and that these effects were much larger than those of race or ethnicity. These SES differences were quite large; the percentages of middle-income children performing some tasks was 2–3 times more than that of the lower income children (Lonigan et al., 1998). In a study comparing the phonological awareness of bilingual students of varying SES, Cisero and Royer (1995) also found better developed phonological aware-

ness in the higher SES students. Maclean et al. (1987) and Fernandez-Fein and Baker (1997) also looked at the child's knowledge of nursery rhymes. They asked the child to recite five common nursery rhymes, noting correct or partially correct responses. Both groups found that knowledge of nursery rhymes very strongly correlated with phonological awareness.

From these studies it appears that phonological awareness starts to emerge as early as age two, that it increases with age, becoming finer-grained to the point of phonemic awareness in many older preschoolers, that some combination of SES and/or parental education influences this development, and that independent of those two demographic factors, a child's knowledge of nursery rhymes seems to contribute to his/her development of phonological awareness.

BILINGUALISM AND PHONOLOGICAL AWARENESS

To discuss how bilingualism affects phonological awareness, it is necessary to discuss some issues regarding second language (L2) acquisition. Unfortunately, this is a highly controversial and inconclusive area of research, because many studies from the educational research are methodologically compromised (Willig, 1985). Thus, although it is difficult to make many conclusive statements regarding the benefits and problems of bilingual education, some trends in the literature do emerge.

Second Language Acquisition

Ever since Uriel Weinrich introduced the idea of first language (L1) "interference" in second language (L2) acquisition in 1953, it has been a powerful idea in shaping how linguists understand L2 learning (Watson, 1991). Although interference is generally acknowledged to occur, it has been difficult to describe its specific effects (Garcia, 1983; McCollum, 1981; Schiff-Myers, 1992; Watson, 1991). There is much agreement that in "balanced" bilinguals—those with solid and equal command of both L1 and L2—that interference is a temporary condition that occurs when L1 and L2 are learned sequentially rather than concurrently (Garcia, 1983; Schiff-Myers, 1992; Winsler, Diaz, Espinosa, & Rodriguez, 1999). It is also generally agreed that balanced bilinguals are far less common than individuals who have greater facility/dominance in either L1 or L2.

Given these unknown interference factors, designing bilingual programs that promote both L2 and L1 learning has been problematic. There have been a number of studies of bilingual programs and reviews of those

studies, but the quality of both the studies and reviews has been questioned. For example, one large and well-publicized study, the National Association for Bilingual Education (NABE) study in 1991, has been criticized for serious methodological failings, including reliance on retrospective parent report for determining children's L1 and L2 language proficiency and nonrepresentative subject sampling (Winsler et al., 1999). The NABE study concluded that rapid L1 loss was common for children attending monolingual (L2) programs and that this disrupted communication between parent and child.

Winsler et al. (1999) attempted to design a methodologically tighter study of the question of L1 loss in young students. They compared L1 and L2 proficiency of preschoolers who attended a half-day English/half-day Spanish program ("alternate immersion") to preschoolers who remained at home and spoke mostly Spanish with family. Cohorts were randomly selected, matched for ethnicity, SES, and initial Spanish proficiency. At 1-, 2- and 3-year follow-ups, it was found that the preschool-attending cohort had not only developed superior English language skills but also had lost no ground in Spanish skills to the stay-at-home cohort. The preschool-attenders even had a few areas of Spanish language development that exceeded the stay-at-home group, although these latter presumably had more Spanish exposure.

The Winsler study can, however, be criticized for some flaws, for example, not matching cognitive level of cohorts, not considering educational level of parents, and most importantly, the nonequivalence of the experimental and control groups in terms of general life situation, that is, one cohort is being schooled and the other is not.

These are the sorts of methodological problems that Willig (1985) tried to take account of in her comprehensive meta-analysis of 23 studies of the effects of bilingual education. She examined studies that compared bilingual maintenance programs to total immersion programs, that is, programs that made no attempt to maintain L1 skills. Willig found that students in bilingual programs scored either the same or higher than students in immersion programs on achievement tests in both L1 and L2. Willig's analysis also indicated that students in alternate immersion programs, that is, programs in which the day is divided into two halves each entirely in one language, outperformed students in other types of bilingual programs or total immersion programs.

Cummins (1989) and Hakuta and Gold (1987) cite Willig's study as they argue for bilingual maintenance programs. They also cite studies that found increased cognitive flexibility in students in bilingual programs.

Green (1997) found that a strong language foundation in L1 facilitates learning in L2, and Hakuta and Gold cite many studies that have demonstrated cross-language transfer of expertise in math, science, social studies, and literacy skills. Bilingual students are apparently able to transfer the knowledge and skills gained in L1 to L2 learning when they are not forced to abandon those in order to learn an L2.

Cross-Language Transfer of Phonological Awareness

There have been several studies that have demonstrated the importance of phonological awareness in the development of literacy skills in languages other than English, including French, Italian, Serbo-Croatian, Swedish, Danish, Norwegian, Spanish, and Turkish (Bruck & Genesee, 1995; Campbell & Sais, 1995; Cisero & Royer, 1995). These studies have shown that the specifics of phonological awareness skills vary depending on the more salient phonological aspects of a language. So, for example, Italian children are more adept at syllable and phoneme detection than English children, and Czech children have higher phoneme awareness than English but lower onset-rime detection; this parallels the saliency of those phonological forms in those languages (Bruck & Genesee, 1995).

There have been very few studies that have looked at phonological awareness in bilingual students and fewer yet that have examined the specific question of whether phonological awareness taught in one language will transfer to another. All of these studies, found in an ERIC search, are discussed below.

Bruck and Genesee (1995) compared English-speaking students in a monolingual school to English-speaking students in a French immersion program. These K and Grade 1 students were tested on several phonological awareness tasks in English. Bruck and Genesee found that the immersion kindergartners had slightly superior onset-rime manipulation skills compared to the monolingual children. This difference no longer showed up in Grade 1, but the bilingual students had developed some superiority in syllable awareness while the monolingual students had slightly superior phonemic awareness skills. Bruck and Genesee suggest that the superior onset-rime detection of the K bilingual students resulted from increased metalinguistic abilities because of exposure to an L2. They explain the Grade 1 bilinguals' superiority in syllable detection by noting that syllabic structure is more salient in French than in English; again, exposure to an L2 increased metalinguistic skills. Finally, they believe that the superiority of the

Grade 1 monolinguals in phoneme detection resulted from their schooling in English reading, which the bilingual students had not received. Because all testing was done in English, these results support the idea of cross-language transfer of phonological awareness skills.

Cisero and Royer (1995) compared the language skills of K and Grade 1 bilingual students in bilingual classes to bilingual students in monolingual classes; kindergarten students were tested in L1 (Spanish) only, and Grade 1 students were tested in both L1 and L2 (English). In general, those in bilingual classes did better on Spanish phonological awareness than students in monolingual classes, but the latter did better in English phonological skills. There was evidence of cross-language transfer of phonological awareness: kindergarten L1 phonological scores did predict first grade L2 phonological scores.

Durgunoglu, Nagy, and Hancin-Bhatt (1993) tested Grade 1 Spanish-speaking students with limited English on several L1 and L2 measures. They found that L1 phonological awareness correlated with L1 and L2 word recognition and argue this demonstrates that acquisition of L1 phonological awareness aids in developing literacy skills in both languages. Neither L1 nor L2 oral proficiency correlated with word recognition, indicating that it is not general verbal skill but specifically phonological awareness that was significant.

Stuart-Smith and Martin (1997) tested 7-year-old bilingual Panjabi (L1)–English (L2) students on phonological awareness in both languages and in English literacy. They found that there was a strong relationship between L2 phonological skills and L2 literacy but no relationship between L1 phonological skills and L2 literacy. They note that this appears to contradict the findings of Durgunoglu et al. (1993) and ask, “why should we expect that knowledge of the sound structure of Panjabi words could help a child learning to read and write in *English*?” (p. 189, their emphasis). Durgunoglu et al.'s anticipates that question and maintains that phonological awareness enables a child to see and reflect on the components of a language and that this broader metalinguistic ability—not specific phonemic or literary knowledge—is what is being transferred.

A study by Campbell and Sais (1995) could certainly support this hypothesis. They tested monolingual (English) and bilingual (Italian/English) preschoolers and found significantly higher performance by the bilingual students on many of the phonological and semantic tasks. Although both cohorts performed equally on picture-vocabulary and letter recognition tests, the bilingual children were superior on a test requiring them to sort pictures of objects by category. Campbell and Sais also

mention that the shallower orthography of Italian as compared to English may have aided the bilingual preschoolers in acquiring phonological skills.

Mumtaz and Humphreys (2001) tested the English-reading and phonological awareness skills of bilingual (Urdu-English) and monolingual (English) 7-year-old children. They found that the bilingual children had superior phonological awareness and were more adept at reading regular and nonsense words. They were less adept, however, at reading irregular words, that is, English words with low sound-to-symbol correspondence. Mumtaz and Humphreys believe that Urdu's shallow orthography helped increase the bilingual phonological awareness and general reading skills, but that because of this shallow orthography, their visual reading skills were less developed. This supports the whole language critique of phonics instruction: English orthography is so unphonetic that learning to read phonetically is not very useful (Smith, 1985).

This also calls to mind the Paulesu et al. study (2001), in which the underlying neuroanatomy of dyslexia was the same cross-lingually but that this anatomy had differential effects depending on the shallowness or depth of a language's orthography. Although it seems clear that phonological awareness skills aid in the acquisition of literacy, they appear to do so somewhat less in languages with deep orthographies. This supports the point made by Bialystok and Herman (1999) that bilinguality is not a simple variable like gender or age but a complex variable that depends on languages known, degree of balance between them, and so on, and that we should be cautious when making broad statements about bilingualism.

This said, in the studies examined above there is good evidence that cross-language transfer of phonological awareness occurs, that is, that L1 skills are generalizable and transferable to L2 and thereby enhance the development of literacy in L2. Durgunoglu et al. (1993) assert that phonological awareness skills are not transferred but rather enhanced by bilinguality. These questions of directionality can only be resolved by further research.

We can now return to our original question: In what language should we teach phonological awareness to bilingual preschoolers? This question must be embedded within the larger question of what is the appropriate language of instruction for bilingual students. As discussed above, the research on the benefits of bilingual education is not definitive; however, the research does indicate that bilingual programs are more beneficial than total monolingual immersion programs for bilingual students, and that alternate immersion programs—half-day L1

and half-day L2—enhance learning more than traditional bilingual programs or total immersion. In an alternate immersion program, phonological awareness could be taught in both languages; thus we would be giving bilingual students more opportunity to learn phonological awareness and the advantages of the type of bilingual education most likely to enhance other cognitive development and skill acquisition.

EDUCATIONAL INTERVENTIONS

No phonological awareness curricula specifically designed for preschoolers was located by this author. This lack of published materials for this age group should not be taken as a reflection of the significance accorded early intervention by the research. No researchers suggest that these skills emerge suddenly in kindergarten; rather, phonological awareness is a group of related skills that emerges slowly throughout early childhood. The shortage of curricula may be due to low awareness of the need for phonological awareness education for preschoolers and to the poor economic incentives for development of preschool curricula.

Although published phonological awareness curricula for preschoolers are not yet available, the earlier sections of curricula designed for kindergartners can be used effectively with younger children. There is a lot of variation in preliteracy skills among preschoolers. In general, the majority of preschoolers would not be able to distinguish phonemic structures occurring medially or terminally in a word, but can be taught to first detect the syllables of a word and then onset and rime (Bryant et al., 1990).

The curriculum designed for kindergarten, *Phonemic Awareness in Young Children* (Adams, Foorman, Lundberg, & Beeler, 1998), could be used with preschoolers by using only the earlier sections. The curriculum includes oral games to encourage development of listening skills, ability to rhyme, and awareness of syllables and phonemes. Also included is an appendix with simple poems and common childhood rhymes and games. From Good's DIBELS curriculum (1998), the sections teaching onset and rime skills are appropriate for preschoolers. In these the child is instructed to point to pictures that start or end with a specified phoneme. Lundberg et al. (1988) describe an 8-month program that they used with Danish preschoolers. Their program starts with nursery rhymes, rhymed stories, and rhyming games. It progresses to sentence segmentation into words, syllable clapping, games in which a child guesses a whole word from one syllable, and recognizing initial phonemes.

Perhaps the most useful and enjoyable curriculum is the use of nursery rhymes. As discussed above, Fernandez-Fein and Baker (1997) and Maclean et al. (1987) found that knowledge of nursery rhymes correlated strongly with later literacy skills. Nursery rhymes can be taught with special emphasis on the word transformations within them. They are not only highly engaging for children but also teach the onset-rime skills most appropriate for preschoolers. For example,

Jack and Jill went up the hill
(What sound is the same in 'Jack' and 'Jill')
("what sound is the same in 'Jill' and 'hill'?")

Onset can also be taught through a variety of word games. Children can name foods they like that start with the same sound as their name: "Tommy likes tomatoes, Melanie likes mangoes, Peter likes potatoes, and Kaitlin like cauliflower." The teacher can also direct children to make up nonsense words with a specified onset or rime: "How many words do you know that rhyme with 'jump'?" and then have the students make sentences with the real words and the made-up words: "I love to jump over a fat lump of mump." Most preschoolers love to engage in this type of word play.

Kirtley, Bryant, MacLean, and Bradley (1989) reviewed the linguistic literature on alliteration and rhyme and note that they are commonly used in many languages and suggest that it is a natural proclivity to enjoy their use. The use of nursery rhymes and like materials provides a language-enriched environment in which children can develop these natural abilities. Dowker (1989) elicited poems from 133 preschool children by presenting them with brief examples of rhyming, alliterative or metaphorical phrases. Most children were able to produce at least a few lines having meter. Forty-four percent of the poems contained rhyming and 16% alliteration. Dowker argues that this sort of word play is a natural part of language development and aids in developing more sophisticated phonological and language skills.

Creating a curriculum for the teaching of phonological awareness skills in a language other than English can rely on all the materials cited here. As nursery rhymes and children's songs are common to many cultures, some of the most important aspects of phonological awareness can be taught through these readily available materials. The poetic devices of alliteration, rhyme, and meter are frequently embedded in these forms, and these are most useful in helping children develop listening skills and phonological awareness.

Many day care centers and preschools commonly employ workers from the same ethnic group as the par-

ents of the children in attendance there. These workers and the children's parents could work together to compile a collection of childhood rhymes and songs from their country of origin. Priority could be given to those materials that contain the elements necessary to teach phonological awareness. There are additional advantages to creating and using a curriculum of this sort: the children learn aspects of their own culture that might not otherwise be available to them, and the parents and children feel their culture valued. This could only help in parent-school relations and increase continuity between home-school settings for purposes of both learning and behavior.

SUMMARY

What, then, is an appropriate training program to develop phonological awareness in bilingual preschoolers? The literature on phonological awareness reviewed here suggests that phonological awareness is not simply correlated to literacy skills but plays a strong causal role in the development of them. Weak phonological awareness skills are highly predictive of later reading difficulties, but these weak skills are usually remediable with appropriate training. It has thus been recommended that phonological awareness be taught even to young preschoolers, and some simple programs have been outlined. These include structured training programs and the teaching and practice of nursery rhymes or other rhyming and alliteration activities.

There has also been a discussion of the effects of bilingual education with the conclusion that alternate immersion programs, in which students learn a half-day in their native language and a half-day in the language to be acquired, are probably the most educationally effective. Given this, and given the importance of phonological skills for the development of literacy skills, it has been recommended that bilingual students be taught phonological awareness in both languages through an alternate immersion program. The absence of prepared phonological awareness curricula in languages other than English need not create a significant problem. Preschool and kindergarten curricula can be assembled from the childhood rhymes and songs of many countries and the principles of the teaching of phonological awareness applied to those materials.

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