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ABSTRACT

Phonological awareness is one of the strongest predictors of success in learning to read. Recent research findings indicate that the development of proficiency in the first language (L1) reading structures may significantly influence reading acquisition in a second language (L2). However, little is yet known of the predictive relationship of phonemic awareness and reading ability or disability for low performing pre-literate children who are exposed to more than one language during the reading acquisition phase of development. Existing evidence suggests the crossover of phonemic skills as measured by their application to reading in L2 suggests that these skills are not language specific. This paper reports on the initial efforts of a 3-year longitudinal study of the effect of phonological skills intervention to promote cross-language transfer of reading skills where a large-scale assessment of preliterate kindergartners' phonological awareness was conducted in Spanish and English. Results reveal significant correlation between English and Spanish language phonological assessment tasks, which were modifications of those widely used and reported in the literature. (Contains 17 references and 3 tables.) (KFT)

Promoting Literacy Crossover

Running head: Phonological skills

Individual Differences in Phonological Skills for Spanish Speaking Kindergartners Learning English: Relationship between English and Spanish Phonological Measures

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Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA, April 11, 2001

Abstract

Individual Differences in Phonological Skills for Spanish Speaking Kindergartners Learning English: Relationship between English and Spanish Phonological Measures

A significant research-to-practice gap may be widening in the area of reading readiness for young limited English proficient children. Previous reading research clearly indicates that phonological awareness is one of the strongest predictors of success in learning to read. More recent research findings indicate that the development of proficiency in first language (L1) reading structures may significantly influence reading acquisition in L2. However, little is yet known about the predictive relationship of phonemic awareness and reading ability or disability for low-performing preliterate children who are exposed to more than one language during the reading acquisition phase of development. Further, the measurement and empirical analysis of phonological skills development in children acquiring two oral languages before they acquire literacy has largely remained unexplored with regard to equivalence of measures and assessment tasks. Existing evidence of the crossover of phonemic skills as measured by their application to reading in L2 suggests that these skills are not language specific. This paper reports on the initial efforts of a three year longitudinal study of effects of phonological skills intervention to promote cross-language transfer of reading skills, where a large-scale assessment of preliterate kindergartners' phonological awareness was conducted in Spanish and English. Results reveal significant correlations between English and Spanish language phonological assessment tasks, which were modifications of those widely used and reported in the literature.

A large, increasingly convergent research literature indicates that phonemic awareness in preliterate young monolingual children is predictive of word decoding ability for both good and poor readers (Schneider et al, 2000; Christensen, 1997; Mann, 1993; Ball & Blachman, 1991; Wagner & Torgeson, 1987.) However, little is yet known about the predictive relationship of phonemic awareness and reading ability or disability in preliterate children who are exposed to more than one language during the reading acquisition phase of development. Further, the measurement and empirical analysis of phonological skills development in children acquiring two oral languages before they acquire literacy has largely remained unexplored with regard to equivalence of measures and assessment tasks. Evidence of the crossover of phonemic skills as measured by their application to reading awareness skills in L2 suggests that these skills are not language specific in preliterate children . Durgonoglu et al (1993) investigated L2 (English) word and pseudoword recognition in L1 (Spanish) beginning normal achieving readers and found that English and pseudoword recognition was predicted by both phonological awareness and Spanish word recognition levels. Cisero and Royer (1995) examined crossover of phonological awareness skills in native English and native Spanish speaking first graders and concluded that the ability to isolate initial sounds in L1 predicted that same ability in L2. Riccio et al (2000) similarly found evidence that performance on phonological subtests of onset, rhyme recognition final phoneme and phoneme/syllable deletion all correlated to L1 (Spanish) reading fluency and transferred to L2 (English) reading fluency.

To date, however, we are not aware of any studies that have examined these relationships for *bilingual children at risk for reading failure*. It is alarming that, in light of recent pedagogical and political decisions which will profoundly affect academic and quality of life outcomes for a significant number of our nation's children, there exists a paucity of research on L2 reading acquisition for L1 learners. Conversely, a plethora of research on the mechanisms of reading acquisition for monolingual learners indicate that phonological awareness is one of the strongest predictors of success in learning to read (Brady & Shankweiler, 1991; Krause, & Moore, E., 1997, Stanovich, 1986).

Predictive Stability of Phonemic Awareness Skills

One caveat of phonemic awareness skills and their predictive relationship to word decoding, reading fluency and later reading comprehension ability is that most studies have found that this relationship diminishes as reading ability improves. Cisero & Royer (2000) found longitudinal evidence that suggests that phonemic awareness performance stabilizes over time. Similarly, Wagner et al (1997) found evidence to suggest that "ceiling effects" operate across PA measures in beginning, non-disabled readers. To date, little is known about the stability of poor phonemic awareness performance as a predictor for reading failure in at-risk readers. Similarly, less is known about such stability for cross language reading acquisition (bilingual speakers who learn to read in L2).

A second caveat is the relative soundness of measures and associated tasks to adequately and comprehensively assess phonological awareness. Considerable discussion in the literature has recently emerged regarding the interaction of various assessment tools and their integrity as accurate measures of an assumed isolated phonological awareness sub-skill (Lenchner et al, 1993; O'Connor et al, 1993; Smith et al, 2001). This

concern relates to the first caveat in that some measures may be more or less sensitive to phonological awareness with different ages or abilities of the learners. For example in the assessment data reported here, we found that rime and onset were highly correlated and loaded on the same factors in both languages. While a number of studies have evaluated and discussed the developmental appropriateness of certain tasks as valid and reliable predictive measures, more specific analyses of the measures and phonological tasks themselves (e.g. Christensen, 1997) are needed to clarify which aspects of a task presentation or response requisites clearly do or do not confound these measures. In common practice for administration of phonological awareness tasks, task difficulty may be influenced by memory requirements for executing the task, and prior instruction on task similes (see Smith et al, 2000 for discussion). More importantly for the present study, little if any research has examined these caveats as they pertain to the congruence of phonological awareness tasks across languages, i.e. linguistic and alphabetic codes.

Can Phonemic Awareness Training Promote Crossover?

Project La Patera's larger conceptual focus is on predictive indicators for reading success or failure in at risk bilingual children who are learning to read in L2 (English). While it is clear that Spanish speaking children are over represented in special education, and that language minority children in California and other states follow an increasing divergent trajectory of poor academic performance to that of their non-minority peers over time (California Dept. of Education Star 9 Assessment reports, 1999; 2000), it remains unclear how to discriminate between those having difficulty and those with disability.

Existing studies are encouraging with respect to training effects of phonemic awareness and reading improvement in monolingual children. (See Smith, Simmons & Kame'enui, (2001) for a synthesized review of intervention studies). Evidence of the crossover of phonemic skills as measured by their application to reading awareness skills in L2 suggests that these skills are not language specific in preliterate children.

La Patera intends to longitudinally examine the effects of L1 (Spanish) phonemic awareness training interventions on L2 (English) reading performance for low performing kindergarteners as they progress through kindergarten, first and second grades. The studies cited above lead us to propose that instruction characterized by these same components in L1 will positively facilitate L2 crossover while mitigating risks otherwise associated with normally occurring individual differences. Therefore, Project La Patera aims to functionally demonstrate the positive effects of remedial skills practice in phonemic awareness training in L1 (Spanish) on L2 (English) reading acquisition for native Spanish speaking pre-literate children. The project, a three year longitudinal investigation, will implement a direct instruction intervention with a selected sample of low performing preliterate kindergarteners and continue intervention thru first grade. While all interventions will be conducted in the students' primary (first) language, La Patera will probe and assess both phonemic awareness and reading ability in English across the term of the three year investigation.

Assessing Phonological Awareness in Two Languages: Equivalence of Measures Across Oral Language Abilities

While some literature on phonological awareness has addressed issues of assessment in multilingual individuals (e.g. Durgonoglu et al, 1993; Lenchner et al, 1993, Riccio et

al, 2000), few have directly compared phonological assessment results in children in both primary (L1) and acquired (L2) language before children acquire literacy. The present study aimed to focus on the potential and actual equivalence of project-generated assessments, many of which were modifications of similar tasks cited in the literature. It was anticipated that, consistent with prior research assessing phonological skills in young monolingual children, study participants who are acquiring two oral languages and are preliterate would perform along a continuum of acquisition; that is, best on tests of rime and onset, and less well on final phoneme. It was further anticipated that, consistent with the literature, segmenting tasks would evidence poor performance for most students. More interesting to our investigation of crossover, however, is the relative consistency of performance as assessed across languages on the tasks developed for this project.

Method

Research sites. Data were gathered from 13 kindergarten classrooms in three public school districts in Southern California. The type of kindergarten instruction delivered ranged from English-only to bilingual English and Spanish. Classes were roughly divided into half morning and half afternoon sessions. Two classes were full day kindergarten.

Participants. The students' average age was 67.5 months at the time they began attending kindergarten. The students had attended kindergarten for an average of 86.5 days when testing began. 94.7% of the students were Latino, 3.3% Caucasian and 2% other. Gender of participants was split evenly; with 52% male and 48% female. Students were enrolled in either English only or bilingual, English/ Spanish instructional settings. In the 2 districts using bilingual education programs one district placed in

bilingual education if their oral English language was low the other placed all children in bilingual programs regardless of oral language ability.

Procedures. The overall assessment battery administered to all participants included both standardized and non-standardized assessments to evaluate baseline phonemic awareness, letter knowledge, vocabulary and sentence memory in both Spanish and English. These included the PPVT, TVIP, letter identification, letter sounds, onset, rime, final phoneme, segmentation, and sentence memory. Students were assessed individually in 20 minute periods in a pull-out process at their own school sites, by trained graduate and undergraduate research assistants who were native Spanish speakers. Basal and ceiling criterion were utilized per instructions on all published instruments.

Phonological Awareness Tasks. Four measures were chosen to measure students' phonological knowledge. The measures were created so as to not impose a working memory load on children and to be easy for young children to demonstrate. La Patera created all phonological tasks due to a lack of existing complementary English and Spanish measures. All phonological tasks began with three practice items followed by 15 test items. Measures were given in a random order to each child. Directions and practice items for each task were given in the child's language of choice or both languages if the dominant language was unclear to the examiner. After the practice items the language of testing would alternate between Spanish and English. If the child began one task in English the next task would begin in Spanish.

Rime. This task assessed the students' ability to recognize words with the same sounds after the initial consonant. Children were asked to choose a word that rhymed or sounded like with the first word presented. The examiner would point to a picture and ask

which word rhymes with or sounds like the first word, the examiner then points to two other pictures and says their names. The student replies by pointing to or saying the word they think rhymes with the first word. For example, "Cat, which word rhymes with or sounds like, cat, bat or log?

Onset. Onset measured students' ability to hear the first sound in a word. This task was administered in the same fashion as Rime although the students were asked which words starts with the same sound as the first word. "Casa", which word begins with the same sound as "casa". Students were required to match the sound of the first word with one of two choices presented.

Final Phoneme. This task assessed the students' ability to identify the last sound in a word. Children were asked to match final sounds in words; the procedure was the same as rime and onset. The child was asked to point to a picture or say the word that ended with the same sound as the first word.

Segmentation. The purpose of this task was to determine children's ability to separate phonemes in a word. Children were asked to divide a whole word into segments when presented with the word orally and a picture representation of the word. Children were given credit if they identified each phoneme in a word correctly.

Results

Table 1 presents the descriptive data on the phonological measures. As anticipated, students performed best on tests of rime and onset, followed by final phoneme, with segmenting being very difficult for most students. Means vary exactly as the predictive model relationship of the developmental progression of phonemic awareness, (Smith et

al, 2000) would have predicted with a sequence of: rime, onset, final phoneme, and segmentation.

Insert Table 1 about here

Table 2 reports students' performance on the individual measures as an illustration of task difficulty. Students appeared to perform differentially at basal or ceiling ends of the assessment scale. Students in our sample performed best on rime and onset, with an average of 10% of students scoring 100%; 3.8% missed every item. Students performed less well on final phoneme measures; an average of 9.75% missed all of the items. Segmentation was the most difficult with 78% of students missing all items.

Insert Table 2 about here

Pearson correlation results of the individual phonemic awareness tasks as measured on this sample revealed the following, as seen in Table 3. First, all English tasks were significantly correlated with their Spanish counterparts, with English and Spanish onset coefficients of .447, coefficients for rime of .609, and coefficients for segmentation of .573. English and Spanish final phoneme were found to be the least correlated measures, with coefficients of .164. Because the English and Spanish measures are interrelated they appear to be tapping the same construct regardless of language of presentation. Second, rime and onset were significantly correlated within and between languages. Third,

Spanish onset correlated with English final phoneme, whereas English onset did not. Finally, Spanish and English rime were significantly correlated with English final phoneme, although only English rime was correlated with Spanish final phoneme.

Insert Table 3 about here

Discussion

It was anticipated that study participants who are acquiring two oral languages and are preliterate would perform along a continuum of acquisition; that is, best on tests of rime and onset, and less well on final phoneme, with segmenting being more difficult for most students. This continuum of acquisition has been found in previous research literature assessing phonological skills in young monolingual children (Christensen, 1997, Cisero & Royer, 1995). The results obtained here suggest that, beyond language specificity, phonemic awareness skills may be aptly characterized as a cognitive skill that develops sequentially regardless of monolingual or bilingual oral development.

Perhaps the most striking finding from this study, however, was the absolute relationship between Spanish and English measures. The fact that each measure was related to its language counterpart implies that the constructs being measured are related to an underlying cognitive skill versus a language specific one. With regard to the convergent literature implicating phonological awareness intervention as positively influencing word-reading abilities in school settings, we propose that *which language to train phonological awareness skills-primary (home) language or secondary (acquired) language-* is a question worthy of empirical investigation. Our data may be interpreted to

mean that such skill development may occur independently of language spoken. Therefore, if other benefits that native oral language may contribute to literacy acquisition (e.g., contextual knowledge, vocabulary familiarity, home literacy environmental influences) are shown to be significant, instructing preliterate students in phonemic awareness in their dominant language may be preferred. This may be a significant intervention strategy for low performing preliterate children in particular.

While the extant literature addressing cross-over lends support to the notion that phonemic awareness skills spontaneously transfer across languages, more research is needed to explore the differential effects of interventions in which preliterate children with varying performance profiles are considered in treatment manipulations. Training in L1 would for low performing preliterate children would appear to be indicated if indeed, mastery of their native language phonological concepts further removed language related confusion. This last issue has not been sufficiently explored in the empirical literature.

Apart from the apparent equivalent relationship of phonological skills measures across languages, our data indicate that there may be a language related difference in English and Spanish tasks for final phoneme. While these two tasks were correlated, they did not correlate with other measures (onset and rime) similarly. This may be attributable to a difference in what has been referred to as the transparency of languages; there are relatively fewer final sounds in the Spanish lexicon, with a high frequency of words ending in 'o' or 'a'. A lower frequency of occurrence of CVC words in our Spanish tasks may also account for this difference. Our English measures utilized mainly consonant sounds from CVC words, whereas the Spanish measure had relatively few CVC words and more words ending in 'a' or 'o'. A further examination of language differences

within final phonemes and exploration of adaptation to account for this different may be warranted.

The initial results reported here indicate that phonological measures employed in this investigation were equivalent as measures of phonological skill development. Our results lead us to explore how training efforts may promote crossover of reading skills to L2, particularly for children who performed significantly less well than their peers on these measures. We anticipate that results of our ongoing, longitudinal examination of intervention effects for these children will offer further insight into how literacy crossover is best facilitated in young preliterate children.

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Table 1. Descriptive statistics.

	Mean	Std. Deviation	N
Spanish Onset	.49	.33	208
English Onset	.43	.34	208
Spanish Rime	.51	.35	208
English Rime	.56	.31	208
Spanish Segmentation	.01	.20	208
English Segmentation	.01	.16	208
Spanish Final	.34	.26	208
English Final	.35	.28	208

Table 2

Task	*Percent of Students 100% correct*	*Percent of students 0% correct*
Spanish Onset	5.7%	4.3%
English Onset	12.4%	3.8%
Spanish Rime	11.9%	2.9%
English Rime	10.5%	4.3%
Spanish Segment	1.4%	80.4%
English Segment	0%	75.6%
English Final	1%	9%
Spanish Final	.5%	10.5%

Table 3. (N=208)

	Spanish Onset	English Onset	Spanish Rime	English Rime	Spanish Segment	English Segment	English Final	Spanish Final
Spanish Onset	1.00							
English Onset	.45**	1.00						
Spanish Rime	.45**	.31**	1.00					
English Rime	.42**	.38**	.61**	1.00				
Spanish Segment	-.02	-.01	.12	.10	1.00			
English Segment	.10	.05	.15*	.13	.57**	1.00		
English Final	.20**	.00	.30**	.32**	.01	.15*	1.00	
Spanish Final	.04	.10	.06	.16*	-.01	-.03	.16*	1.00

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

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