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Phonological awareness: Cross-linguistic comparisons with a focus on Spanish

Amanda Clinton[1]
María Quiñones
University of Puerto Rico, Mayagüez, Puerto Rico
Catherine Christo
California State University, Sacramento

Resume

El propósito de la revisión de la literatura actual es poner de relieve las diferencias y similitudes en procesos fundamentales de lectura según el idioma del alumno. Se presta especial atención a los contrastes entre el idioma Inglés que es relativamente opaco y otros idiomas que son mas transparentes, con un enfoque específico en el español. El Análisis de la literatura indica un desarrollo más pronunciado curvar en idiomas como el español, aunque los procesos son similares. Resultados ponen de relieve la forma en el que una lengua materna más opaca podría informar el aprendizaje de un Segundo y más transparente idioma.

Palabras clave: Fonología, Español, lenguaje

Conciencia fonológica: Comparaciones lingüísticas cruzadas con un enfoque en el español

Abstract

The purpose of the present literature review is to highlight differences and similarities in fundamental reading processes depending upon the language of the learner. Specific attention is paid to contrasts between the relatively opaque English language and more transparent languages, with a specific focus on Spanish. Analysis of the literature indicates a steeper developmental curve in languages such as Spanish, although processes are similar. Findings highlight the way in which a more opaque native language could inform learning of a second, more transparent language.

Keywords: Phonology, Spanish, language

Early identification of individuals at risk for reading difficulties is an issue of critical importance for psychologists and educators, as well as for dyslexic children and their families. Research over the past 20 years has elucidated the component processes involved in reading acquisition (Adams, 1990). The successful beginning reader readily acquires the alphabetic principle (Perfetti, 1994; Wagner & Torgesen, 1987), or the understanding that print stands for specific sounds in language, thereby initiating a process of reciprocal causation between phonological awareness (PA) and reading (Stahl & Murray, 1994; Stanovich, 1981). That is, as children learn to read, their familiarity with common letter patterns aids in the development of automatic word recognition. As such, theories of reading acquisition emphasize reciprocity between processes (e.g., Perfetti, 1992).

Although provocative conclusions about the process of learning to read may be drawn from the literature on PA, the majority of this research pertains to the English language. Recent cross-linguistic studies utilizing subjects speaking languages other than English have provided data indicating the presence of subtle differences in the reading acquisition process (e.g., Landerl, Wimmer, & Frith, 1997, Zeigler & Goswani, 2005). These studies are important because they help distinguish between those universal components of reading acquisition and those that are a function of particular orthographic and phonological systems.

Cross-linguistic research indicates that the degree of regularity in an orthography makes a significant difference in the accuracy and ease with which children decode words (Bruck, Genesee, & Caravolas, 1997; Seymour, Aro & Erskine, 2003). Traditional PA (sound/symbol matching) tasks - strong predictors of reading ability in English - do not distinguish well between readers of languages of near-1:1 sound-symbol cor-

[1] University of Puerto Rico, Mayaguez, PR; email: amanda.clinton@gmail.com

respondence, like Spanish. This suggests differential weights for respective processes in early reading. Since the world is increasingly multi-lingual and many children in Latin America learn both English and Spanish, a review of the literature of reading acquisition processes considering the more transparent Spanish versus the relatively opaque English can offer key insights into normative and disabled reading acquisition and, in turn, illuminate assessment and intervention.

The goal of this review is to discuss the role that phonological awareness plays in learning to read across languages with a focus on Spanish. It is critical to begin widening our lens from its predominant focus on English in order for psychologists to complete meaningful assessments and design effective interventions. In the pages that follow, a review of the research on PA in English speaking populations will be presented. Cross-linguistic studies analyzing PA follows. Finally, a section specific to Spanish is presented. Conclusions complete the article.

Phonological Awareness in English

Phonological awareness plays an important role in learning to read in English. The results of a large number of studies demonstrate a strong and consistent relationship between children's abilities to analyze sounds in the stream of speech and their progress in learning to read (e.g., Ball & Blachman, 1991; Castles & Coltheart, 2004; Uhry & Clark, 2004; Shaywitz, 2003; Wagner & Torgesen, 1987). Indeed, identification of the key role of PA in the reading process is considered one of the great successes of modern psychology (Stanovich, 1987).

While a consensus exists regarding the importance of PA in learning to read, debate surrounds its specific contribution to word reading (e.g., Ehri, 1992; Goswami & Bryant, 1990; Morais, Alegria, & Content, 1987; Scarborough, 2005). Although the connection is almost certainly bidirectional (Stahl & Murray, 1998), the specific nature of the pathway between PA and reading continues to be defined. Some researchers describe PA as "a powerful determinant of the speed and efficiency of learning to read" (Goswami & Bryant, 1992, p. 49) while others deem phonemic awareness essential but not determinant (Nation & Hulme, 1997).

Reciprocal processes between PA and reading include success with simple phoneme awareness tasks, such as initial consonant segmentation, prior to simple word recognition. However, some recognition of words typically precedes more advanced PA abilities, such as deletion. (e.g., Stahl & Murray, 1994). Causal influences between kindergarten letter name knowledge and PA, as well as between PA and first- and second- grade decoding skills also indicate reciprocity between PA and word reading (Goswami, 1993; Wagner, Torgesen, & Rashotte, 1994).

Cross-Language Phonological Awareness

Phonological awareness clearly plays an important role in reading English. The cross- language literature does not possess the depth of the English language literature, yet a number of studies indicate a relationship between reading progress and success at PA tasks in languages such as Swedish (Lundberg, Olofsson, & Wall, 1980), German (Näslund, Schneider, & van der Broek, 1997), and Italian (Cossu et al., 1988), among others. The importance of the phonemic structure of words varies according to the particular characteristics of a language (e.g., Caravolas & Bruck, 1993; Cossu et al., 1988; Korkeamäki, 1997).

Languages differ widely in the complexity of their phonological structures. For example, the number of distinguishable vowels, the incidence of morphophonemic alternation, and the diversity of syllable types frequently vary (Cossu et al, 1988 Ziegler & Goswami, 2005). For this reason, a number of authors have explored the possibility that the level of difficulty associated with the analysis of words into syllables, onset-rime units, and phonemes might vary across languages (e.g., Bruck, Genesee, & Caravolas, 1997; Cossu et al., 1988; Wentink, van Bon, & Schreuder, 1997) and, thus, influence the relationship between PA and reading (e.g., Cossu et al., 1988; Näslund et al, 1997). For example, Pugh (2006) indicates that while a deficit in PA may be the core deficit for struggling readers, it will manifest differently across languages. The complexities of PA depend on the phonological and orthographic aspects of a language, as observed from studies in Swedish (Lundberg, Oloffsson, & Wall, 1980), Italian (Cossu et al., 1988), and Greek (Loizou & Stuart, 2003). Results of Swedish research support the relationship between rhyme tasks and reading progress, similar to English. The Italian study confirmed a developmental curve for PA tasks, which is also observed in the English language. Greek and English, meanwhile, influenced one another as each was learned.

While a number of similarities surface between PA and reading across languages, differences exist as well. Higher success rates and sharper developmental curves on PA measures are commonly associated with transparent languages, such as Italian (Cossu et al., 1998), Dutch (Wentink, van Bon, & Schreuder, 1997), Spanish (Manrique & Gramigna, 1984), and Finnish (Korleamäki, 1997). Differential levels of awareness of onsets in the highly transparent Czech also suggests that the development of PA is shaped by the nature of the phonological and orthographic input associated with a particular language (Caravolas & Bruck, 1993).

Cossu et al. (1988) explain that the quantitative difference in the degree of accuracy found between the Italian and English subject performance on measures of PA – where Italians made considerably fewer errors and essentially achieved results at ceiling levels of longer length than those administered to the American children – is due to the structure of each language. Italian has a simpler open-syllable form and utilizes a small number of syllable types, thus making analysis into syllables relatively easy compared to English, with its closed-syllables and considerable variation of syllable types. This uniformity of correspondence between letters and phonemes in transparent languages such as Italian is hypothesized to facilitate the development of sensitivity to sublexical structures, a skill that may have to be directly taught in English due to its orthographic irregularity.

Additional data offers support for the syllable, as opposed to the onset-rime, as the key decoding unit in languages with greater transparency than English. French-speaking kindergarten students have been observed to perform better than English-speaking peers on syllable counting measures, while the English children perform better than the French on onset-rime and phoneme items (Bruck, Genesee & Caravolas, 1997). Similarly, a study of Dutch children reported an absence of onset-rime effects in a training program aimed at improving PA skills via decoding instruction (van den Bosch, 1991). The author hypothesizes that patterns of performance on certain phonological awareness measures mirror the structure of a particular language. Indeed, research indicates that phonological recoding is not significantly challenging for readers of regular languages even as young as preschool (Castles, Wilson & Coltheart, 2010). This finding contradicts the idea of a core phonological processing deficit which has been supported in English research on disabled readers.

Conclusions from information collected using Finnish (Korkeamäki, 1997), Italian (Cossu et al., 1988), and French (Bruck et al., 1997) suggest that speakers of regular languages may automatically acquire the alphabetic principle, without the presence of direct instruction. In other words, use of a language with a regular orthography provides daily phonemic training for the learner, particularly with the commencement of reading instruction. For example, in Bruck's study of French children (1997) who were exposed to considerably fewer early literacy opportunities at school, at home, and from the media, few repercussions in word recognition skills were observed in first grade. They made fewer errors on word recognition tests (French 24% errors v. English 48%) and nonsense-word reading measures (French 37% errors v. English 64%) than English-speaking peers from print rich environments.

Phonological Awareness in the Spanish Language

Spanish, like English, is an Indo-European language. As a direct descendent of Latin, however, Spanish falls into the romance language category along with French, Italian, Portuguese, and Catalan, among others. It has 18 consonants and 5 vowels, in contrast to English, which uses 24 consonants and 12 to 14 vowels (Merino, 1992). The syllabic structure of Spanish is relatively simple due to the predominance of CVCV (55.94 percent) patterns in its words. Syllable types that pose greater difficulties on phonological segmentation tasks, such as CCV clusters with liquids, are rare in Spanish (3.5 percent). The vocalic consists of five vowels with well differentiated areas and allows for clearer recognition of sounds than English. Further, being a regular language with a largely transparent orthography, sound by sound translation into letters typically renders a conventional spelling or an orthographically acceptable substitute (Borzone de Manrique & Signorini, 1994). Irregular words effectively do not exist in Spanish. This language also possesses a better defined syllabic structure than does English (Manrique & Graminga, 1984). As a result, the consistency of the orthographic system and the saliency of the syllable are frequently emphasized during early reading instruction.

As with English and Italian, Spanish-speaking children demonstrate a developmental curve for phonological awareness skills. A study using Argentinean subjects showed that syllabic segmentation is more readily mastered than phonemic segmentation in Spanish (Manrique & Gramigna, 1984). In fact, the tapping task appears to be understood by both skilled and unskilled readers of Spanish by first grade (Borzone de Manrique & Signorini, 1994). This method of measuring phonemic segmentation seems to be so straightforward for Spanish- speaking subjects that, at least from kindergarten forward, meaningful correlations between it and reading are not typically found (Manrique et al., 1994). More complicated PA batteries, which include PA tasks at both the rhyme and phonemic levels, are mastered at a younger age in Spanish speakers than in speakers of English, as well (Carillo, 1994; Nation & Hulme, 1997).

Linguistic effects specific to the Spanish language have been isolated on PA tasks. Jiménez and Haro (1995) repeated a Treiman and Weatherston (1992) study using Spanish- speaking subjects in order to investigate whether findings relevant to American children apply to those in Spain. Findings indicated several distinctions. Five and 6-year-old English speaking children separated the onset of a word when

it began with a stop consonant with greater ease than those commencing with fricatives. In Spanish, words beginning with continuant consonants (/s/, /m/, /f/, /r/) were easier than those beginning with stop consonants (/p/, /b/, /g/, /d/). The Jiménez and Haro (1995) study also reported that syllable-initial consonant clusters presented a challenge to Spanish speakers and floor effects were observed in the youngest participants.

To evaluate the effects of word length in PA performance, Jiménez and Haro (1995) compared children's ability to segment the onset from CVC and CV'CVCV structures. Participants obtained higher scores on shorter, rather than longer words, with a greater effect for the five-year-olds. These findings, however, contrast with those of Cossu et al. (1988) who included two-, three, and four-syllable words in their investigation of PA in Italian, a language very similar to Spanish, did not have a deleterious effect on performance.

The syllable has been identified as a particularly salient unit in Spanish word recognition (Jiménez & Valle, 2000). A comparison of average 9-year-old readers, a group of 9-year-old children with reading impairments, and a reading-level matched group of younger subjects demonstrated a significant interaction between reading level and syllable position for the younger subjects. Words with low frequency syllables challenged young readers, while reading-disabled subjects were not affected. Further, nonwords were recognized more quickly when they contained high-frequency syllables. Authors interpret these results as indicative of the importance of the syllable in Spanish. Durgunolglu, Nagy, and Hancin-Bhatt (1993) similarly argued that the perfect mean score achieved by 31 first-graders on their syllable segmentation tasks indicates that "in Spanish, as in English, syllables are an easier speech unit to manipulate than are phonemes or onset-rime units" (p. 458).

Phonological awareness and reading in Spanish

Goldstain & Cintrón (2001) researched the phonological skills of Puerto Rican, Spanish- speaking 2-year-olds to determine PA patterns specific to Spanish as compared to those commonly exhibited by speakers of a variety of languages. They predicted that similarities in results across languages "may be indicative of more universal tendencies in phonological acquisition" (p. 355). Syllable structure, number of final consonants, number of consonant clusters, and types of deletions demonstrated similarities across languages. Differences between Spanish-speakers and speakers of other languages included types of cluster reductions, word length, and substitution patterns. The authors reported that cross-linguistic differences may show possible language or dialect-specific refinements made by children.

Correlations between word reading and phonological awareness have been demonstrated in cross-linguistic studies of native Spanish speakers attending school in English-speaking countries. Durgunolglu, Nagy, and Hancin-Bhatt (1993) administered Spanish language tests of PA to 31 first grade students of Latin descent who were learning to read in English, although their native language was Spanish. Results showed that Spanish PA was strongly related to both word and pseudoword reading (r= .51 and r= .68, respectively) of English. Spanish word recognition, as well as performance on Spanish PA, yielded significant beta weights and predicted English word recognition. Regression analyses indicated that PA was a significant predictor of performance on word recognition tests both within and across languages. The authors hypothesize that it was likely that those children who were able to reflect on one language possessed the metalinguistic skills to reflect on their second language, as well. Thus, they suggest that phonological awareness is not developed specific to a particular language. Cisero and Royer (1995) also isolated evidence for transfer of phonological awareness skills, with English reading in their sample of 36 first-graders of Puerto Rican background.

Carrillo (1994) carried out a detailed study addressing the relationship of PA to reading with a group of 68 kindergarten and 52 first grade children in Spain. Results support the Goswami & Bryant (1992) theory of reading in which children acquire rhyme and alliteration skills prior to reading acquisition, at which point they learn to analyze words phonemically. Even the youngest subjects, half of whom were nonreaders, found the aforementioned tasks manageable. Initial deletion, final isolation, and counting and reversal of segments were extremely difficult tasks that occasionally led to floor effects. By first grade, however, scores on each type of task were similar. All PA tasks correlated with word decoding in kindergarten. In first grade, however, significant correlations for rhyme and alliteration tasks were obtained.

Evidence for the use of analogy in reading Spanish surfaced in an investigation by Sebastian-Gallés and Vacchiano (1995), where children from six years demonstrated its use in pseudoword reading. Age-based variance in error patterns suggested that analogical reading errors and lexicalization correspond to different mechanisms (e.g., Defior, Justicia, & Martos, 1996; Valle-Arroyo, 1996). Lexicalizations may result from inaccurate orthographic processing, while analogical errors could reflect failures in phonological decoding that are affected to some degree by the reader's lexical knowledge. This data is considered "consistent with the

prediction of easy and early access to [the phonological] route in Spanish" (Morais, 1995, p. 3).

In a study conducted by Quiroga et al. (2002), 30 Spanish-speaking English-as-a-second- language first graders from immigrant families, all of whom received all their school instruction in English, responded to a battery of Spanish and English measures of phonological awareness, Verbal IQ, oral language proficiency, and single-word reading (real words and pseudowords). The authors hypothesized that phonological awareness and letter knowledge in Spanish would predict phonological awareness and word reading in English. That is, that PA transfers across first and second languages and across oral and written language. Results showed that the Spanish phonological awareness measure was significantly correlated with the English phonological measure. The authors concluded that "phonological awareness is related to learning to read English when one's first language is Spanish and reading instruction is in English" (p. 97). Friesen and Jared (2007) obtained similar findings in their study with English-French bilinguals.

Similar to children involved in studies in English (e.g., Christensen, 1997; Wagner, Torgensen, & Rashotte, 1994), Spanish-speaking subjects demonstrate variability in patterns of phonological awareness skill acquisition and reading development (Carello, Lukatelz, & Turvey, 1994). In other words, certain PA tasks do not always precede the ability to read and reading ability does not necessarily indicate successful phoneme manipulation. Some kindergartens who could read 15% of words on a reading test (the criterion level established by the author to distinguish readers from non-readers) performed poorly on PA tasks. Others who obtained above average scores on PA tasks of sound similarities and/or measures involving detection or isolation of segments scored low in reading. Interestingly, these subjects attended schools in which phonics was deemphasized in favor of whole-word instruction. The author concluded – contrary to what has been proposed in other highly regular languages such as Finnish and Italian – that some amount of training may be required for individuals to acquire a "full development of phonological awareness" (p. 295). Method of instruction, therefore, may impact the ability to acquire the alphabetic principle in languages like Spanish where grapheme-phoneme correspondences are largely one-to-one. This finding calls into question the hypothesis that regular languages permit automatic acquisition of the alphabetic principle in context, without the necessity of phonics drills (e.g., Cossu et al., 1988; Korkeamäki, 1997).

Conclusions

In a world that is becoming increasingly multilingual, the question of linguistic differences and similarities, as well as the influence of one language on another in terms of normative and aberrant reading processes is key. This issue may be particularly pressing in relation to the question of English, a notoriously inconsistent language in terms of letter sounds and letter symbols, and Spanish, a very regular language, due to the high numbers of Spanish- speaking children attending school in the United States or learning English in their native countries (Barnwell, 2008). Psychologists should possess a solid understanding of this issue and its linguistic implications in order to conduct meaningful assessments and ensure design of useful interventions. The current review addressed the need to expand knowledge of phonological awareness and orthographic processing as fundamental to learning to read across languages.

The PA literature based on English-speaking populations provides a rich foundation upon which researchers can now address particular aspects of phonological processing. Current information clearly indicates that PA skills are critical to the acquisition of word reading. Debate still surrounds the issue of the developmental process through which children gain PA and the point at which reciprocal influences between an awareness of individual sounds in the speech stream and basic literacy knowledge begin to influence one another. However, it is certain that PA is necessary but not sufficient to explain reading acquisition. While letter knowledge and reasoning skills contribute, more specific skills such as knowledge of orthographic patterns are of key importance. Overall, it is easy to agree with Stanovich's (1981) assertion that identification of the role of PA in early English literacy is one of the research community's great successes. As with English, PA appears to be related to word reading across languages, including German, Swedish, Finnish, and Italian, and others, although differently. Recent research indicates that this relationship may be weaker in more transparent languages than in English. A developmental curve, wherein syllables are mastered prior to measures requiring isolation of individual phonemes, has been confirmed as a cross-linguistic phenomenon. The question seems to be one of whether or not PA tasks are related to reading across languages, but one of identifying the precise details and importance of the relationship depending on the particular language spoken by young readers.

While phonological awareness skills appear earlier and tasks correlate more strongly with reading performance in relatively transparent orthographies with an

emphasis on the syllable rather than English's prosodic stress, the situation is not clear cut. Not just the regularity of grapheme-phoneme correspondences and natural syllabic breaks in words affect PA, but whether the frequent syllable form is open or predominantly closed may influence saliency and impact performance on PA tasks (Delattre, 1966; Peters, 1997).

The primary focus of the current review being Spanish, it is important to summarize findings related to this language. Studies of phonological awareness in the Spanish language demonstrate certain similarities and differences when considered in comparison to English. A developmental curve, wherein syllabic segmentation is acquired prior to phonemic segmentation can be seen in both groups, as in other languages. However, readers of transparent languages like Spanish appear to experience a considerably more rapid acquisition curve in PA skills. While certain phonological awareness tasks tend to be mastered prior to reading acquisition in Spanish, this is not an invariable pattern. Particular linguistic aspects of languages appear to have particular effects on performance of phonological awareness measures with syllable-initial clusters, for example, presenting particular difficulty for Spanish speakers. Some evidence has been found for the role of rhyming and alliteration as precursors to reading among children from Spain. These findings parallel those found among English- speaking subjects. Like English speakers, Spanish speakers appear to present a deficit, as opposed to a delay, in reading if the impairment is defined as poor nonsense-word reading. The details of the similarities and contrasts between reading difficulties in Spanish and English remain to be delineated, however. In fact, although many similarities exist between the two languages, PA tasks actually account for considerably less variance in Spanish reading than they do in English-speaking children. Thus, while particular aspects of the linguistic puzzle of reading acquisition in Spanish can be explained, a number of pieces have yet to be put in place.

In sum, early readers of relatively transparent languages tend toward rapid acquisition of phonological awareness and orthographic processing skills. By comparison, learning to read in a relatively opaque orthography implies a steeper learning curve in relation to phonological and orthographic information due to the numerous irregularities in terms of sound-symbol relationships. As such, fluency – often measured by rapid naming tasks – may be a much better indicator of early reading skill than phonology or orthography when one is attempting to evaluate early literacy in Spanish. Psychologists should carefully consider this prior to utilizing translated versions of tests considered strong predictors of reading that were designed based upon the English language, since their clinical significance is not equivalent.

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Amanda Clinton. University of Puerto Rico, Mayagüez, Puerto Rico
María Quiñones. University of Puerto Rico, Mayagüez, Puerto Rico
Catherine Christo. California State University, Sacramento