

Print Awareness Skills of Children with Hearing Loss

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ABSTRACT

Many children with hearing loss show delays in acquiring emergent literacy skills. These delays can profoundly impede later reading development. Print awareness is one emergent literacy skill that predicts later reading outcomes in children with normal hearing. However, print awareness skills of children with hearing loss are not well understood. This pilot study evaluated print awareness skills in monolingual and bilingual children with hearing loss as part of a larger study on emergent literacy skills. Print awareness skills of monolingual and bilingual children did not differ; however, neither group performed at levels expected for their chronological age. In addition, bilingual children did not exhibit superior print awareness skills in their home language, Spanish. Differences between groups in home literacy practices, such as designating time for reading, may explain this finding.

INTRODUCTION

Literacy achievement in children with hearing loss is notoriously poor. Reading levels of children with hearing loss increase at a rate of only half of a grade each year, plateauing at the third- or fourth-grade level (e.g., Qi & Mitchell, 2011). Even though technological advances in amplification (e.g., cochlear implants) for children with hearing loss have been made over the past several decades, the average reading level for this population has not increased (e.g., Trybus & Karchmer, 1977; Qi & Mitchell, 2011).

Children begin to develop emergent literacy skills even before the onset of formal schooling (e.g., Hiebert, 1981; Mason, 1980; Read, 1986; Sulzby, 1985). Emergent literacy skills consist of phonological awareness, oral language, and print awareness. These emergent literacy skills consistently predict later reading outcomes for preschoolers with and without disabilities. Although children with hearing loss have documented deficits in emergent literacy skills such as phonological awareness and oral language (e.g., Moeller et al. 2007), print awareness skills rarely have been studied. Print awareness, or knowledge of forms and functions of print, is associated with reading outcomes of children with normal hearing (Whitehurst & Lonigan, 1998). Because literacy outcomes for children with hearing loss are so poor, it is important to build a complete picture of emergent literacy skills in the population.

Home literacy practices, including book reading, predict print awareness in children with typical language (Justice & Ezell, 2002) but not in children with specific language impairment (Skibbe et al., 2008). Because home literacy practices appear to affect print awareness differently in disordered populations and because children with hearing loss have generally poor reading outcomes, it is important to understand the relation between home literacy practices and print awareness skills in children with hearing loss.

In addition, home literacy practices differ across cultures (e.g., Hammer et al., 2007). The incidence of hearing loss in Spanish-speaking children is increasing rapidly (Rhodes, Price & Perigoe, 2004). Children from Spanish-speaking homes have fewer opportunities to develop English print awareness than English-speaking peers (Hammer, Miccio, & Wagstaff, 2003). Thus, characterization of the impact of home practices on print awareness in children with hearing loss should include children from Spanish-speaking homes.

The purpose of this pilot study was to begin to evaluate print awareness skills in children with hearing loss.

METHOD

PARTICIPANTS

Participants were 16 preschool children with hearing loss (mean age = 59 months, SD = 11; mean hearing age = 44 months, SD = 20) who wore amplification and attended auditory-oral preschool programs. Children were either monolingual speakers of English or bilingual speakers of Spanish and English. Children with suspected cognitive impairments were excluded.

Participant Characteristics

Child ID	Age (in mos)	Hearing Age	Amplification	Home Language	Vocab (R/E)
1	44	16	CI	English	77/63
2	52	8	HA	English	94/86
3	52	22	CI	English	74/57
4	55	49	CI	English	<55/<55
5	55	20	CI, HA	English	81/67
6	58	54	HA	English	76/79
7	82	77	HA	English	81/76
8	39	33	HA	Spanish	74/80
9	54	48	HA	Spanish	91/94
10	54	51	CI	Spanish	84/107
11	59	47	CI	Spanish	89/107
12	63	54	CI	Spanish	<55/73
13	65	32	CI	Spanish	55/55
14	68	62	CI	Spanish	79/76
15	70	65	CI	Spanish	68/74
16	73	60	HA	Spanish	85/93

PROCEDURES

This study is part of a larger study exploring early literacy skills of children with hearing loss. Children participated individually in assessment of early literacy skills, including phonological awareness, letter knowledge, oral vocabulary, and print awareness. Only print awareness measures are reported here.

An adaptation of the **Preschool Word and Print Awareness Assessment** (PWPA; Justice & Ezell, 2001) was administered. The PWPA assessed print awareness skills embedded in a storybook reading event. Additional questions were added to the original PWPA within the existing categories of the measure to give multiple opportunities to illustrate knowledge of constructs, and all questions were translated to Spanish. The **Print Concepts** subtest contains questions about the mechanics of reading books. The **Words in Print** subtest contains questions about specific print features. Bilingual children completed the PWPA in both languages. Parents completed a survey about home literacy practices (adapted from Boudreau, 2005). Questions addressed topics including time spent reading per week, explicit teaching of early literacy skills, and children's behavior during book reading.

RESULTS

Do monolingual children with hearing loss outperform bilingual children with hearing loss on print awareness measures administered in English?

No.

T-tests revealed no difference between monolingual and bilingual groups on the English PWPA (Print Concepts: $p = .57$; Words in Print: $p = .53$).

Percent Correct Responses on English PWPA by Item

Question	Percent Correct
PRINT CONCEPTS	
Show me the front of the book.	87.5
Show me the name of the book.	37.5
What do you think it says?	75.0
Where do I start reading?	12.5
Then which way do I read?	25.0
Show me where one of the ducks is talking.	6.3
Do I read this page (left) or this page (right) first?	43.8
There are four lines on this page. Which one do I read first?	6.3
Which line do I read last?	12.5
Why are all these words in the water?	6.3
Show me just one letter on this page.	31.3
Show me the first letter on this page.	6.3
Show me a lowercase letter on this page.*	18.8
Show me a capital letter.	6.3
And the fox says, "Silly ducks." Where does it say that?	18.8
(normal hearing: 55%**)	TOTAL 26.3
WORDS IN PRINT	
Show me just one word on this page.	18.8
Show me the little words on this page.	25.0
Show me the big words on this page.	6.3
Show me the first word on this page.	0
Show me the second word on this page.	0
Show me the very last word on this page.	6.3
How many words are on this sign?	12.5
How many words does the mouse say?	0
How many words is this?	0
Show me the longest word on this page.	0
Show me the shortest word on this page.*	6.3
Show me the space between two words.	12.5
Point to the words as I read	6.3
Show me the word, "Spot."*	0
Show me the first letter in this word.*	12.5
Show me the second letter in this word.*	0
Show me the last letter in this word.*	0
(normal hearing: 30%**)	TOTAL 6.3

* Questions added, ** Justice & Ezell (2001)

RESULTS

Do bilingual children with hearing loss exhibit differential performance on measures of print awareness depending on language of administration?

Maybe.

There was no statistically reliable difference in the mean scores of bilingual children's performance across language of administration (Print Concepts: $p = .44$; Words in Print: $p = .13$). However, Cohen's d on Words in Print was .46, indicating a moderate effect favoring English administration over Spanish administration. A post-hoc power analysis indicated 39 participants per group were needed to establish statistical reliability.

Do home literacy practices differ for monolingual versus bilingual children with hearing loss?

Yes.

The home literacy survey revealed that 77% of monolingual children were read to several times each week, compared to 50% of bilingual children. Further, 67% of monolingual parents reported having time designated for reading with their child, compared to 40% of bilingual parents. However, groups did not differ in hours that children spent reading as reported by parents. ($p = .30$).

DISCUSSION

Print awareness of children with hearing loss did not vary by language-learning status in this study. Children with hearing loss exhibited universally low performance on these tasks compared to a normal hearing sample reported by Justice and Ezell (2001). If children with hearing loss have the same home and school experiences as children with normal hearing, these findings suggest that direct instruction in this area might be necessary.

A moderate effect size was present in the comparison of language of administration for bilingual children ($d = .46$), indicating more knowledge of print in the language used at school, contrary to our hypothesis. Differences in home literacy practices, such as designating times for reading and frequency of shared reading, may contribute to this discrepancy. Parents of bilingual children appear to engage in home literacy practices less frequently than parents of monolingual children. Alternately, it could be that parents of bilingual children read English books at home.

To develop effective interventions, future work should confirm these results with a fully-powered sample of children, directly compare performance to children with normal hearing, and consider other factors that influence print awareness skills in children with hearing loss.

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References available upon request: language@vanderbilt.edu
Poster available at: www.mc.vanderbilt.edu/languagelab