

# Phonological Awareness and Letter Knowledge In Preschool Children with Hearing Loss

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## ABSTRACT

Children with hearing loss often have difficulty acquiring early literacy skills. Phonological awareness and letter knowledge are important but distinct early literacy skills. This study evaluated phonological awareness and letter knowledge in 19 preschool children with hearing loss. Participants completed measures of initial sound and rhyme matching, as well as letter names and letter sound knowledge. Children demonstrated varying patterns of performance across types of skills. Results and educational implications are discussed.

## INTRODUCTION

Phonological awareness and letter knowledge are two important precursors of word reading (Adams, 1990), as well as important components of early literacy instruction (NRP, 2000). Reading, along with the development of early literacy skills, is delayed in children with hearing loss (e.g., Most, Aram, & Andorn, 2006; Paul, 2009). Although preliminary evidence suggests that phonological awareness and letter knowledge are related to later reading and spelling in children with hearing loss, there is surprisingly little research on early literacy skills in this population.

### Phonological Awareness

Easterbrooks et al. (2008) reported that children with hearing loss have particular difficulty with phonological awareness skills. Children with hearing loss tend to perform poorly compared to same age peers with normal hearing on phonological awareness tasks (Kyle & Harris, 2011; Miller, 1997; Most, Aram, & Andorn, 2006; Sterne & Goswami, 2000). As with children with normal hearing, phonological awareness is a predictor of reading outcomes in children with hearing loss (Harris & Beech, 1998).

### Letter Knowledge

Little research on letter knowledge of children with hearing loss exists in the literature, particularly English letter knowledge. Most et al. (2006) reported that Hebrew-speaking children with hearing loss knew fewer letter names than their normal hearing peers. In a longitudinal study of early literacy development, children with hearing loss outperformed their normal-hearing peers on measures of letter name knowledge at age 5 ( $d = 1.06$ ), but by age 7 both groups performed near ceiling. However, children with hearing loss lagged their normal hearing peers in letter sound knowledge at age 5 ( $d = .99$ ), and by age 7, the gap had increased ( $d = 2.13$ ; Kyle & Harris, 2011).

Further understanding of the state of phonological awareness and letter knowledge in children with hearing loss is needed. Of particular interest in the present study is the pattern of performance of children with hearing loss on these two types of early literacy knowledge.

## PURPOSE

The purpose of this pilot study was to evaluate phonological awareness and letter knowledge in preschool children with hearing loss.

## METHOD

### PARTICIPANTS

Participants were 19 preschool children with hearing loss (mean age = 59 months; SD = 12) who wore amplification and attended auditory-oral preschool programs. Children with suspected cognitive impairments were not included. Children were either monolingual speakers of English or bilingual speakers of Spanish and English.

Child ID	Age (in mos)	Hearing Age	Amplification	Home Language	Vocab (R/E)
1	42	18	CI, HA	English	54/54
2	44	16	CI	English	77/63
3	52	8	HA	English	94/86
4	52	22	CI	English	74/57
5	55	49	CI	English	<55/<55
6	55	20	CI, HA	English	81/67
7	58	54	HA	English	76/79
8	67	45	HA	English	86/83
9	82	77	HA	English	81/76
10	39	33	HA	Spanish	74/80
11	54	48	HA	Spanish	91/94
12	54	51	CI	Spanish	84/107
13	59	47	CI	Spanish	89/107
14	63	54	CI	Spanish	<55/73
15	65	32	CI	Spanish	55/55
16	68	62	CI	Spanish	79/76
17	70	65	CI	Spanish	68/74
18	73	60	HA	Spanish	85/93
19	76	52	CI, HA	Spanish	73/66

### PROCEDURES

This study is part of a larger study of 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 phonological awareness and letter knowledge are present here. Current study measures included:

STUDY MEASURES
PALS-K Initial Sounds
PALS-PreK Rhyme
PALS-PreK Letter Names
PALS-PreK Letter Sounds

## RESULTS

What patterns of performance are exhibited by preschool children with hearing loss on measures of phonological awareness and letter knowledge?

### Phonological Awareness

Child ID	Initial Sounds (max 10)	Rhyme (max 10)
HIGH ON BOTH		
8	10	9
18	9	5
HIGH INITIAL, LOW RHYME		
2	7	4
HIGH RHYME, LOW INITIAL		
1	2	6
4	2	6
9	3	10
10	2	5
11	1	6
13	3	8
16	3	6
17	2	9
LOW ON BOTH		
3	1	4
5	3	2
6	3	3
7	3	4
12	4	3
14	0	4
15	2	4
19	2	4

### Letter Knowledge

Child ID	Letter Names (max 52)	Letter Sounds (max 26)
HIGH ON BOTH		
8	51	24
9	50	15
18	48	21
HIGH NAMES, LOW SOUNDS		
7	27	0
13	37	12
14	27	0
17	40	6
19	32	1
HIGH SOUNDS, LOW NAMES		
(none)		
LOW ON BOTH		
1	9	0
2	14	0
3	3	8
4	4	0
5	2	0
6	7	7
10	1	0
11	2	1
12	20	0
15	3	10
16	5	2

Children exhibited different patterns of performance on both types of early literacy skills. With regard to phonological awareness, two children performed above 50% correct on both tasks, one performed above 50% correct on only Initial Sounds, eight performed above 50% correct on only Rhyme, and eight performed about 50% correct on neither task. With regard to letter knowledge, three children performed above 50% correct on both tasks, five performed above 50% correct on only Letter Names, and eleven performed above 50% correct on neither task. On letter knowledge measures, no children scored above 50% correct on Letter Sounds but not Letter Names.

## RESULTS

How do children with hearing loss perform on measures of phonological awareness and letter knowledge compared to preschool benchmarks?

Measure	Benchmark	Mean	SD	Median	Range
Rhyme	5-7	5.37	2.24	5	2-10
Initial Sounds	5-8	3.26	2.62	3	0-10
Letter Names	17-38	20.11	18.21	14	1-51
Letter Sounds	4-8	5.63	7.60	1	0-24

Group means were within the test benchmark ranges for all measures except Initial Sounds (below benchmark). However, medians and ranges indicated that over half of children performed below benchmarks on each measure.

Are measures of phonological awareness and letter knowledge related in preschool children with hearing loss?

	Rhyme	Initial Sounds	Letter Names	Letter Sounds
Rhyme	--	.181	.597**	.527*
Initial Sounds		--	.513*	.644**
Letter Names			--	.667**
Letter Sounds				--

All measures were correlated except Initial Sounds and Rhyme. Children scored near floor on Initial Sounds.

## DISCUSSION

Children with hearing loss are at risk for later reading difficulty. It appears that difficulties in literacy for children with hearing loss are present even in early literacy skills. Over half of the preschoolers in this study scored below test benchmarks on measures of phonological awareness and letter knowledge. Children exhibited different patterns of performance across skills.

Early intervention in literacy skills, including early literacy skills such as phonological awareness and letter knowledge, is an important area of inquiry for children with hearing loss. Because children showed different patterns of performance, it is likely necessary for early literacy intervention to be highly individualized for preschool children with hearing loss.

The next steps in this line of research are to further explore early literacy development in children with hearing loss (i.e., longitudinally), to explore what predicts which children will develop age appropriate skills, and to evaluate the effectiveness of early literacy interventions for this population.

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References available upon request: [language@vanderbilt.edu](mailto:language@vanderbilt.edu)

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