

HEARING LOSS AND IT'S CONNECTION TO LITERACY & PRAGMATIC LANGUAGE

Celia Kaufer

BACKGROUND



OUTLINE

1. Hearing Loss and Literacy

- Differences between children with hearing loss (HL) and normal hearing (NH)
- Implications/discussion for clinicians

2. Hearing Loss and Pragmatic Language

- Differences between children with HL and NH
- Implications/discussion for clinicians

LITERACY: STATISTICS

- According to Qi and Mitchell (2012), average child with HL leaving high school reads at a 4th grade reading level
 - Improving with newer research after newborn hearing screening, but still not achieving same outcomes!
- Complete restoration of original auditory signal is not achieved with the use of amplification devices (Singer, Grimes, Christensen 2010)
 - Perceptual processing deficits impact language and literacy
- Lots of variables in the research (Moeller, Tomblin 2015)
 - Factors that all impact linguistic experience: aided audibility, HA use (amount, duration), quantity and quality of caregiver language input

LITERACY: DIFFERENCES

Main source for presentation:

What Clinicians Need to Know About Early Literacy Development in Children With Hearing Loss

Elizabeth Runnion^a and Shelley Gray^a

Purpose: Children with hearing loss may not reach the same level of reading proficiency as their peers with typical development. Audiologists and speech-language pathologists (SLPs) have important roles to play in preventing this problem early in children's development. In this tutorial, we aim to communicate how the habilitation practices of audiologists and intervention services of SLPs can support early literacy skill development in children with hearing loss.

Method: We describe key findings from peer-reviewed research articles to provide a review of early literacy skill

development, to explain the relationship between early literacy skills and conventional reading skills, and to highlight findings from early literacy skill intervention studies that included children with hearing loss who use spoken language. We conclude with a hypothetical case study to illustrate how audiologists and SLPs can support early literacy acquisition in children with hearing loss.

Conclusion: Findings from studies of young children with hearing loss suggest that a promising approach to improving reading outcomes is to provide explicit early literacy instruction and intervention.

Early literacy skills:

- (1) print concept knowledge,
- (2) alphabet knowledge,
- (3) phonological awareness,
- (4) oral language skills

LITERACY: PRINT CONCEPT KNOWLEDGE

- Understanding that language has a purpose, knowledge of direction and orientation of print, identifying words vs. letters, etc.

	Normal Hearing	Hearing Loss
Differences	Print concept knowledge is acquired through experience with print and books from preschool through kindergarten years	According to Werfel 2017, print concept is delayed in preschoolers with HL.
Discussion/ Intervention	No studies that look specifically at intervention targeting print concept. Is the delay due to lack of interest secondary to language difficulties or do they require a different type/amount of exposure to print concepts?	

LITERACY: ALPHABET KNOWLEDGE

- Knowledge of letter names and their corresponding sounds

	Normal Hearing	Hearing Loss
Differences	Emerges in preschool, continues through first grade. Letter naming → sound-letter correspondence	Easterbrooks et al. 2008: Same type of development but HL might require more intensive instruction. Goldberg Lederberg 2015: VC letters learned more readily than CV letters (e.g., “m” easier than “b”), both easier than learning letters without sound in name.
Discussion/ Intervention	Auditory input may affect ease of learning types of letter-sound correspondence Explicit instruction and multi-modal strategies have positive effects on grapheme correspondence (use pictures for semantic cues!)	

LITERACY: PHONOLOGICAL AWARENESS

- Understanding that words are composed of syllables and phonemes. Tested by looking at rhyming, isolation, blending, segmenting, and elision

	Normal Hearing	Hearing Loss
Differences	Order: rhyming, sound isolation, segmentation, blending, deletion. Words → syllables → phonemes	Cupples et. Al 2014: deficiencies from preschool to high school. Webb et. al 2018: same pattern of acquisition.
Discussion/ Intervention	Nittrouer et al. 2012: Deficiencies could be due to incomplete or degraded access to auditory signals (syllables can be represented by amplitude vs. phonemic structure). Werfel and Shuele 2014: Can model phonological awareness intervention after program for children with normal hearing, but may benefit from additional multi-modal strategies.	

LITERACY: ORAL LANGUAGE SKILLS

- Vocabulary, grammatical knowledge, listening comprehension

	Normal Hearing	Hearing Loss
Differences	Children grow lexicon, improve morphosyntactic knowledge, use more syntactically complex sentences, discourse level skills (comprehension, narrative structure, inferencing) throughout early childhood	Guo and Spencer 2017: Morphological markers omitted more often Lower MLU and less complex utterances Lower vocabulary scores Less complex narratives
Discussion/ Intervention	<p>Children with hearing loss lose opportunities to learn vocabulary, morphology, and narrative skills through INCIDENTAL exposures due to perceptual processing deficits, so EXPLICIT instruction is especially important.</p> <p>Theory that grammatical morphemes in English are acoustically insalient– shorter and weaker</p> <p>Desjardin et al 2014: We can coach parents to read with their kids using joint book reading strategies (dialogic reading), which correlate to expressive language skills.</p> <p>Fung, Chow 2005: multi-modal strategies (use pictures!) for vocabulary learning</p>	

LITERACY: TAKEAWAYS

- Many children with HL demonstrate deficits in reading throughout school years
- Because amplification devices may not completely restore signal, children with HL may have persistent acoustic processing deficits which impact language and literacy
- Could be due to difficulty processing at the phonemic structural level and lack of opportunities to learn through incidental exposures.
- Explicit, early instruction is important and multi-modal strategies have positive benefits

PRAGMATICS

- From ASHA.org:
- Pragmatic language is how we use language socially
 - Three major skills: using language for different communicative functions (e.g., greeting, requesting, demanding, etc.), changing language for the listener or situation, following rules for conversation and storytelling
- Pragmatic language skills in students with HL are correlated to success in general education academic outcomes (Thagard, 2011)

PRAGMATICS: RESEARCH

- Most et al. 2010: Pragmatic Abilities of Children with HL compared to NH peers
 - 29 behaviors tracked during communicative interaction with a familiar adult related to verbal aspects, paralinguistic aspects, and nonverbal aspects. Children were matched on language abilities.
 - Results: tracking which behaviors were considered inappropriate
 - Related similarly: topic selection and introduction, prosody, fluency, vocal quality.
 - Both groups showed the most cases of inappropriate behavior in the verbal category (HL: 51.23%; NH: 21.72%), followed by the paralinguistic aspects (HL: 16.67%; NH: 10.77%), and the least cases of inappropriate behavior in the nonverbal aspects (HL: 3.57%; NH: 1.10%)
 - Major differences:
 - Children with HL demonstrated much wider variety of mastery of the skills
 - Noted difficulty all related to turn taking: contingency (ability to continue sharing the same topic as the prior communicative act-add information), response (responding as listener to speech acts), and adjacency (an utterance that occurs immediately after the partner's utterance)

PRAGMATICS: RESEARCH

- Tye-Murray 2003: Conversational Fluency of Children Who Use Cochlear Implants
 - Study
 - Children aged 8-9 with HL and NH engaging in a conversation with a clinician
 - Measured (a) amount of time spent trying to repair breakdown, (b) amount of time spent sitting in silence, (c) ratio of time child vs. adult spoke
 - Findings:
 - Communication breakdowns lasted a significantly longer time for children with HL
 - Speech intelligibility and receptive language were the best predictors of communication breakdowns
 - Discussion
 - Need for explicit instruction in conversation strategies AND repairing communication breakdowns

PRAGMATICS: RESEARCH

- Most 2002: The Use of Repair Strategies by Children With and Without Hearing Impairment
 - 3 groups: NH, HL with good speech intelligibility, HL with poor speech intelligibility
 - Coded 9 repair strategies: Repetition, Revision (rephrasing), Addition, Expansion to two sentences, Cue (provides additional background information), Simplification, Key word, Explanation, Inappropriate
 - Summary of Results
 - All children used repetition as the most common repair strategy for 1st repair
 - Children with HL who had poor speech intelligibility used repetition more
 - Children with HL who had good speech intelligibility used inappropriate responses more
 - Children with NH used more addition, cue, and expansions
 - Implications:
 - Repair strategies are very important if we want children with HL to be successful in “mainstream” general education
 - Are children with HL (with poor speech intelligibility) less flexible with language or are they learned to fix articulation through repetition?
 - Take-away: we can explicitly teach more flexible and complex repair strategies for more functional communication. For example, can we teach them to provide a ‘key word’ or simplify/add information when appropriate to meet the communication partner’s needs?

PRAGMATICS: DISCUSSION

- Potential causes
 - Delayed language acquisition skills cause deficits in pragmatic language
 - Children with HL have limited exposure and practice to communication strategies and partners
 - Is this because of different communicative interactions or are they avoiding communicative failures?
 - Maybe audibility challenges cause difficulties, NOT a lack of pragmatic language skills (e.g., they are able to turn-take, but missed auditory cue)
 - Ziv, Malchi, Meir 2007: Difficulties with theory of mind may cause challenges with pragmatic communication.

PRAGMATICS: TAKEAWAYS

- Pragmatic language seems to be impacted even when language skills are average
- Pragmatic language skills are correlated with academic success
- Intervention targeting pragmatic language skills should be explicitly taught and individualized
- Due to increased likelihood of communication breakdowns, repair strategies are a functional target for this population

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