

Auditory Skill Development of Toddlers with Bilateral Hearing Loss



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Purpose

Early intervention’s (EI) goal is to improve developmental competency among deaf/hard of hearing (DHH) children. Appropriate EI requires tracking auditory skill development for those learning spoken language. It also requires understanding factors such as degree of hearing loss, cognitive abilities, and maternal level of education that influence skill development.

The Cincinnati Auditory Skills Checklist (ASC) is used to identify the skill development of children with cochlear implants. Scores of children with other degrees of HL have not yet been researched.

Objective

Performance analysis of 24-36 month olds with bilateral hearing loss on the Cincinnati ASC as a function of degree of hearing loss, cognition and maternal level of education.

Methods

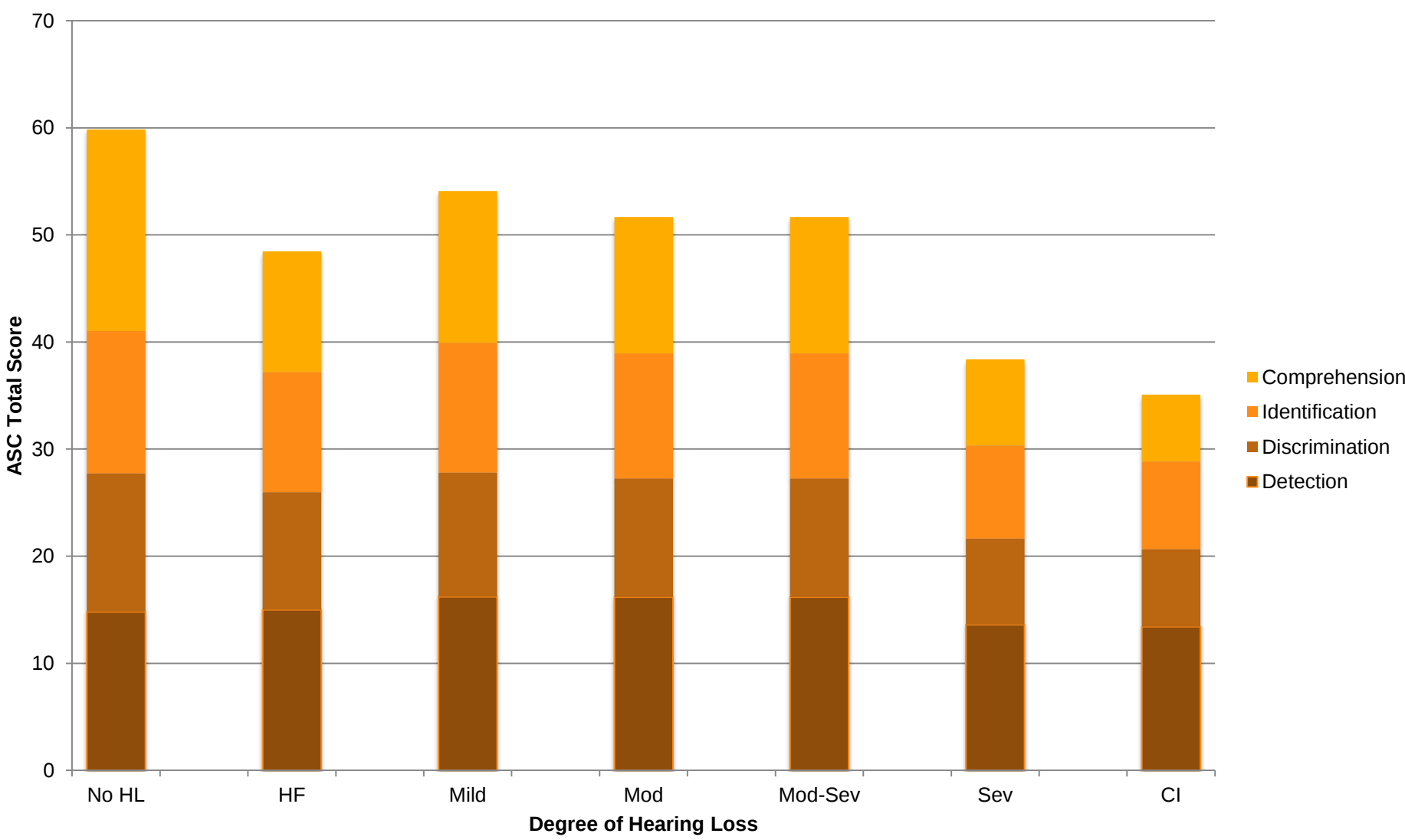
30 subjects without hearing loss and 200 with varying degrees of bilateral hearing loss (306 total). Hearing loss determined by most recent audiogram. 200 subjects with hearing loss have normal and 76 have delayed cognition as determined by a developmental quotient derived from the Minnesota CDI.

Maternal level of education determined by most recent parent report.

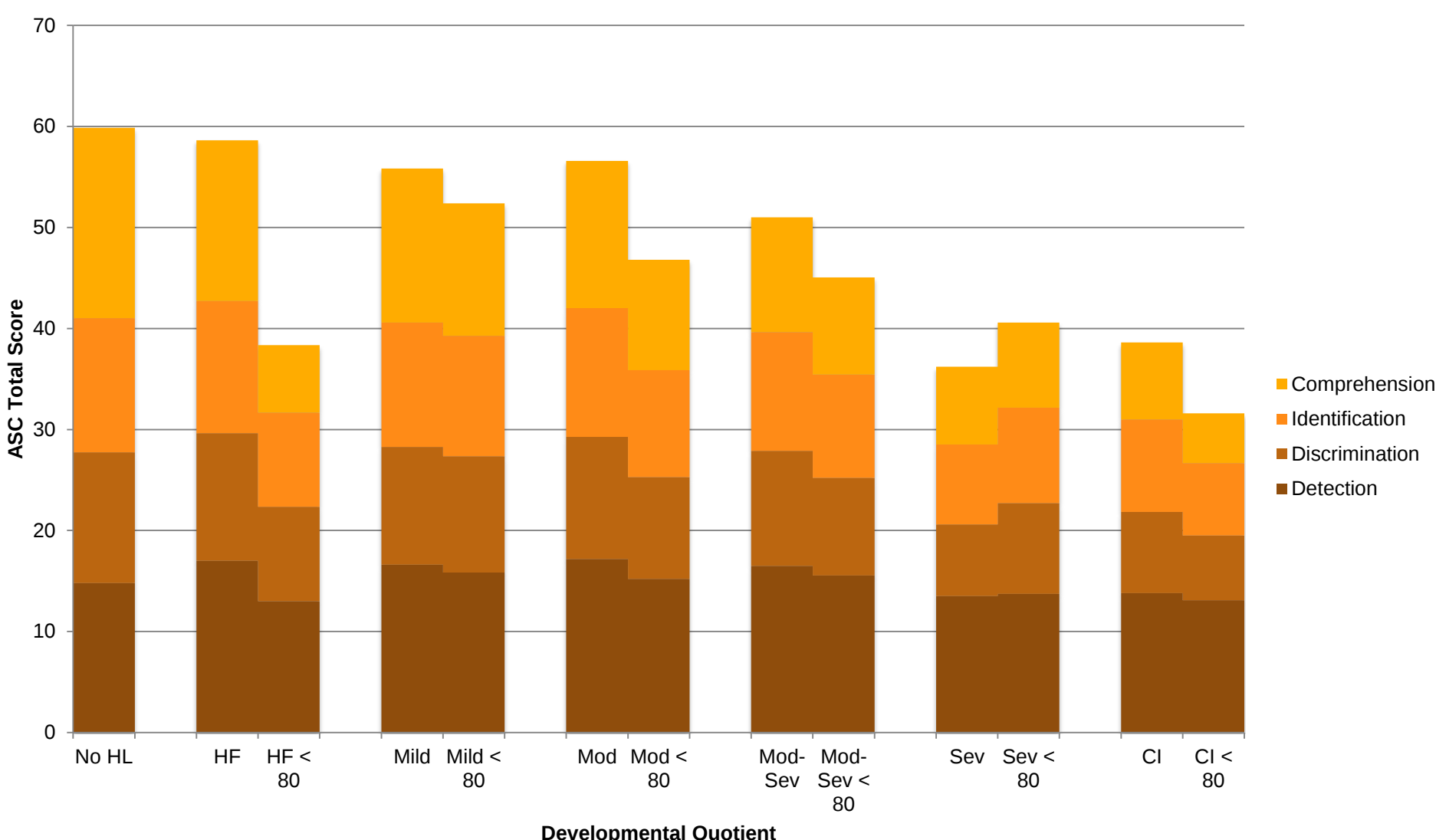
The ASC has 35 items falling into four categories of skills: Detection, Discrimination, Identification, and Comprehension. Scores can be 0 (rarely completes task), 1 (sometimes completes task), or 2 (often completes task) for a total of 70 points.

Results

ASC Subscale Scores by Degree of Hearing Loss



Subscale Scores by HL and DQ



Discussion

- There were no significant main effects for DQ, MLE, and HL.
- Significant interaction for DQ by HL. The relationship between the change in ASC TS and HL depends on DQ.

Limitations

- Small sample sizes for some groups
- Normal hearing children did not reach 80% mastery for some Comprehension items

Summary

- It appears that HL and MLE do not affect ASC scores. DQ, in combination with HL and MLE, may affect scores.

Future Directions

- Establish normative data for NH group
- Establish normative data for DHH groups
- Include children of other ages
 - Determine age of mastery for auditory skills

Key references: 1. White, K. R. (1997). The scientific basis for newborn hearing screening: Issues and evidence. Invited keynote address to the Early Hearing Detection and Intervention (EHDI) Workshop sponsored by the Centers for Disease Control and Prevention, Atlanta, GA. Retrieved on February 2, 2009, from www.infanthearing.org/resources/fact.pdf. 2. Yoshinaga-Itano, C., Sedey, A. L., Coulter, D. K., & Mehl, A. L. (1998). Language of early- and later- identified children with hearing loss. *Pediatrics*, 102(5), 1161-1171. 4. Meinzen-Derr, J., Wiley, S., Creighton, J., Choo, D. (2007). Auditory skills checklist: Clinical tool for monitoring functional auditory skill development in young children with cochlear implants. *Annals of Otolaryngology, Rhinology, and Laryngology*, 116, 812 – 818. 5. Ireton, H., & Glascoe, F. P. (1995). Assessing children's development using parents' reports. The Child Development Inventory. *Clinical Pediatrics*, 34, 248-255. 6. Tyberg, L. (2013). Auditory skill development of children with normal hearing (ages birth to three years), as determined by responses to the Cincinnati Auditory Skills Checklist. University of Colorado, Boulder. **Acknowledgement:** This poster was supported by the Disability Research and Dissemination Center (DRDC) through its Cooperative Agreement Number 5U01DD001007, from the Association of University Centers on Disabilities, and from the Centers for Disease Control (CDC) and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the DRDC, AUCC or the CDC.