

Recent findings on Bimodal Bilingualism

Who are bimodal bilinguals?

Bimodal bilinguals use two languages through two different modalities.

Usually: Sign Language + Spoken Language

Also: Sign Language + Written Language



Should sign language be used with assistive technology?



<https://magazine.uconn.edu/2018/02/28/case-bilingual-deaf-children/>

- Does sign language obstruct spoken language development?
- Can hearing parents provide adequate sign language input?

Debate over bimodal bilingualism in early intervention

Signing does not benefit children with cochlear implants, and may hinder speech development. [1]



Bimodal bilingualism offers protection against language deprivation and more opportunities for language learning. [2]



Disappointing results from Oral Only approaches

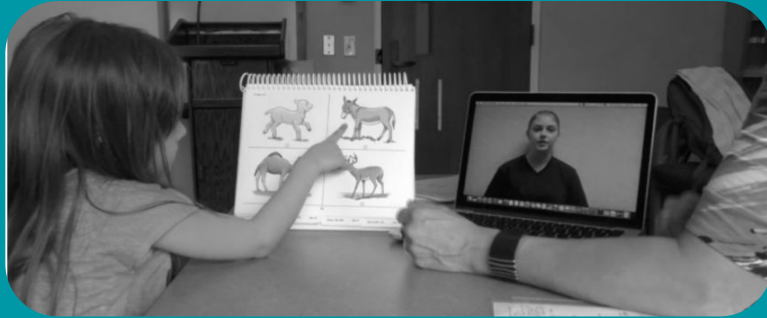


- DHH children now have the advantages of early identification and implantation, improved early intervention practices, and superior technology. [2]
- Yet DHH children still underperform on many measures of language development. [3][4]

[3] Nittrouer & Lowenstein (2021) [4] Carrigan & Coppola (2020)

[People illustrations by Storyset](https://storyset.com/people)

Performance gaps in English for DHH with hearing aid or cochlear implant [3, 4]



- Children (~3-6 years old) with HA/CI had significantly lower vocabulary scores than hearing comparison group.
- 8th grade children with HA/CI showed deficits in interpreting ambiguous sentences (higher level linguistic skill).

Even early use of hearing aids or CI does not guarantee on-time linguistic development for DHH children. They still miss a lot of language input, putting them at risk as academic demands increase.

More reasons why DHH children miss out on language input

- Noisy background and listening fatigue [5]
- Critical periods for language development [6]
- Early deficits due to language deprivation become more problematic as language demands increase with grade level.
- Quality and quantity of parents' responses to pre-implanted DHH children [7]

Age-appropriate ASL vocabulary for DHH babies from hearing families [8]



DHH children exposed to ASL before 6 months of age had receptive and expressive ASL vocabulary comparable to DHH children from signing, Deaf families (104 children).

78 DHH children from hearing families, 8 - 68 months old

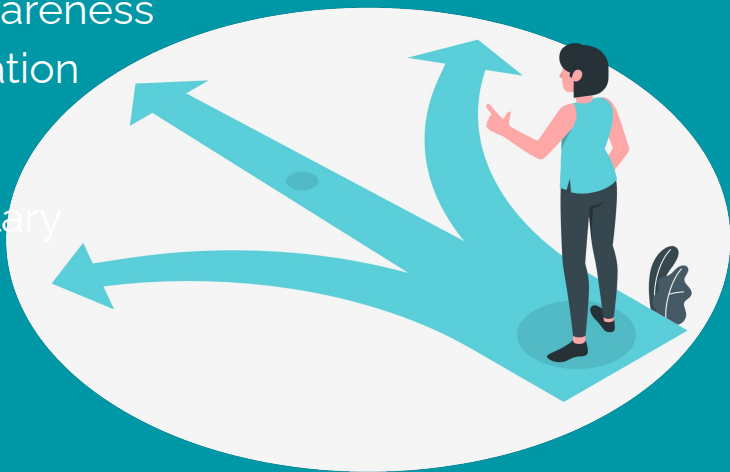
[8] Caselli, Pyers & Lieberman (2021)

Early & natural sign language does not hinder spoken English [9]

General language measures
ASL Receptive Skills Test

Phonological awareness
Phonetic articulation

Expressive vocabulary
Productive syntax



Deaf children with amplification who use a natural sign language with their Deaf families scored in the normal range for hearing children on standard English tests, outperforming oral-only DHH children.

[9] Davidson, Lillo-Martin & Chen Pichler (2014)

Family ASL: Bimodal bilingual development by deaf children with hearing parents [10]

New 5 year project on **hearing parents' L2 ASL development and their DHH children's bimodal bilingual (English & ASL) development**

Goal: Helping hearing parents provide high quantity and high quality bimodal bilingual input

High Quantity

- Unrestricted-available both in and outside home
- From a variety of sources

High Quality

- Sensitive to child's visual needs
- Natural language system with grammatical consistency

AND

Spoken language ~~OR~~ Sign language

"...[E]ven when parents wish for their deaf and hard of hearing child to acquire spoken language, access to sign language should be provided to bridge any language acquisition gaps resulting from incomplete access to spoken language." [4]

"There is too much at stake with the very real possibility of language deprivation for professionals to cling to this outdated argument of 'either/or'" [11]

References

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- [3] Nittrouer, S., & Lowenstein, J. H. (2021). When language outgrows them: Comprehension of ambiguous sentences in children with normal hearing and children with hearing loss. *International Journal of Pediatric Otorhinolaryngology*, 141, 110514.
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- [5] White, B. E. (2019). The Role of Auditory Experience in the Neurocognitive Systems for Everyday and Effortful Listening (Doctoral dissertation, Gallaudet University).

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[6] Cheng, Q., Roth, A., Halgren, E., & Mayberry, R. I. (2019). Effects of early language deprivation on brain connectivity: Language pathways in deaf native and late first-language learners of American Sign Language. *Frontiers in Human Neuroscience*, 13, 320.

[7] Su, P. L., & Roberts, M. Y. (2019). Quantity and quality of parental utterances and responses to children with hearing loss prior to cochlear implant. *Journal of early intervention*, 41(4), 366-387.

[8] Caselli, N., Pyers, J., & Lieberman, A. M. (2021). Deaf children of hearing parents have age-level vocabulary growth when exposed to American Sign Language by 6 months of age. *The Journal of Pediatrics*, 232, 229-236.

[9] Davidson, K., Lillo-Martin, D., & Chen Pichler, D. (2014). Spoken English language development among native signing children with cochlear implants. *Journal of Deaf Studies and Deaf Education*, 19(2), 238-250.

[10] Lillo-Martin NIH grant

<https://today.uconn.edu/2019/12/speaking-language-deaf-children-hearing-parents/>

[11] Secora, K., & Smith, D. (2021). The Benefit of the “And” for Considerations of Language Modality for Deaf and Hard-of-Hearing Children. *Perspectives of the ASHA Special Interest Groups*, 6(2), 397-401.