

Viewpoint

The Benefit of the “And” for Considerations of Language Modality for Deaf and Hard-of-Hearing Children

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Purpose: Language modality choices for deaf children continue to be an area of debate, but we argue that the dichotomy of “either/or” for language modality is outdated in a world that increasingly values bilingualism. Evidence is provided that a bilingual approach to language for deaf children is not contraindicated and that deaf children can learn both spoken and signed language given an adequate amount of exposure to each language.

Conclusions: We note that exposure to signed language during the early phases of auditory evaluation and rehabilitation can reduce missed opportunities for language acquisition. We further suggest that professionals who work with these children and their families need to consider their own biases in how language modality choices are presented in order to provide the best possible support services.

For professionals who work with d/Deaf and hard-of-hearing children (DHH), the discussion of language modality for these DHH children continues to be an area of intense debate. It is often framed as “either spoken language or signed language” and “either hearing aids/cochlear implants or signed language.” We argue that this contrast is a false dichotomy and, in fact, overlooks the numerous deaf students who use some form of both modalities to communicate and/or both signed language and amplification. This article will not examine those who choose to communicate via American Sign Language (ASL) exclusively but will instead focus on individuals pursuing spoken language for their DHH child, client, or student, such as a family that chooses cochlear implants (CIs) for their young child. For those seeking to incorporate spoken language, we suggest that the framework needs to be shifted from this dichotomous viewpoint of “spoken language *or* sign language” and replaced with a “spoken language *and* sign language” philosophy.

As the world becomes increasingly more culturally and linguistically diverse, arguably over half of the world’s population is estimated to be bilingual in at least two languages (e.g., The European Commission, 2012). There is

increasing evidence that spoken language bilingualism does not interfere with learning language for both typically developing children (for reviews, see De Houwer, 2017; Nicoladis & Genesee, 1997) and those with language disorders (e.g., Goldstein, 2006; Paradis, 2007). Furthermore, studies of language modality have indicated that, neurologically, the brain seeks *patterns* in language, whether auditory or visual (Petitto et al., 2000). Researchers and practitioners are calling for bimodal bilingualism to be the standard approach for early intervention with DHH children (Clark et al., 2020). Based on the abovementioned evidence, a bilingual approach for communication is not contraindicated for children, including DHH children.

Research with native signing hearing children (e.g., children of deaf adults [CODAs]) has revealed that learning sign language does not interfere with acquisition of spoken language for children in a variety of age ranges (7 months to 2 years [Petitto & Kovelman, 2003], 1–3 and 4–8 years [Pichler et al., 2014]). CODAs (ages 3–6 years) were shown to have sentence structures and verb inflections similar to monolingual speakers within the same age range (Hofmann & Chilla, 2015). Native signing DHH children (aged 4–7 years) with CIs show no difference on measures of overall spoken language (Preschool Language Scales–Fourth Edition; Zimmerman et al., 2002), expressive English vocabulary, and early literacy skills when compared with typically hearing children who also sign (i.e., CODAs;

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Davidson et al., 2014). The English articulation abilities for the native signing children with CIs were within the expected range for their age, and productive spoken language syntax (using the Index of Productive Syntax (IPSyn); Scarborough, 1990) was acceptable at a 75% or higher cutoff that has been used for other CI users (see Geers, 2004). Davidson et al. (2014) concluded that their samples of CI users were implanted at a similar age range as many other CI users in the literature (between 2 and 3 years old) but differed on the nature of their language exposure: Participants in the Davidson et al. study received full access to grammatically complex ASL from birth from their deaf signing parents and had no language deprivation. Therefore, their language foundation (in sign) may have served to boost their expressive and receptive English into age-appropriate levels. In another study, CI users (aged approximately 2–7 years) in auditory–oral programs (emphasizing listening and spoken language while making use of visual facial cues such as lipreading), spoken and signed language programs, and auditory–verbal therapy programs (emphasizing only listening and speech without visual cues) revealed no differences between groups based on language modality for measures of receptive vocabulary, overall auditory comprehension, and expressive comprehension once covariates were taken in account (Yanbay et al., 2014). For this study, all tests were administered in spoken English, but responses were accepted in either spoken English or sign language.

Arguments for the use of spoken language without any sign language exposure overlook several critical factors. As reviewed in M. L. Hall et al. (2019), many individuals in the same population of DHH children who are touted as “successful spoken language users” continue to fall below the age expectations for typically hearing children. Furthermore, they argue that there has been a critical failure in the literature to define the terminology of “signing.” There are a number of sign systems designed to represent the grammar and syntax of spoken English with signs (e.g., Manually Coded English [MCE]). These are not evidence based as to their efficacy in the classroom (Scott & Henner, 2020) and not acquired like natural languages (Supalla & McKee, 2002). Many studies label both these signing systems and the natural, full language of ASL as “exposure to signs.” It is no surprise then that DHH individuals who experience language deprivation (due to exposure to a constructed system with limited access to spoken language) perform lower on language measures than those with full access to the natural language of English through better auditory abilities. The critical test is to examine those who were exposed to full ASL from birth, which, as seen in the evidence provided by Davidson et al. (2014), leads to solid language foundations and language development within appropriate levels.

It is important to note that many DHH individuals were educated in Total Communication (TC) programs years ago. These TC programs incorporated strategies for using all modalities of communication including, but not limited to, listening and speech, natural signed languages such as ASL, contact sign/pidgin sign, fingerspelling, print, speech reading, gestures (for a review, see Mayer, 2016).

One of the drawbacks of TC programs is that they are often ill-defined or misconstrued as Simultaneous Communication programs (speaking and signing at the same time). As hearing aid and CI technology has exponentially increased over the years, reliance on a spoken language modality has grown in frequency instead of the more traditional TC programs. Mayer (2016) argues that the terminology of TC needs to be revisited and revised in light of the technological advances as this bimodal approach to education and communication is likely to remain for years to come. We support this idea of a reframing of TC to incorporate what is now known about how the brain processes language regardless of modality and to take into account the increases in hearing technology. Furthermore, we argue that it is access to a full grammatical signed language (such as ASL) rather than access to simply any visual forms of communication that might be included in a TC approach (such as MCE) that results in the bimodal bilingualism that appears to support full language acquisition. Children acquire ASL structure and grammar in a similar pattern that typically hearing children do with spoken language, given adequate ASL exposure; however, the same is not true for MCE where, even with significant direct instruction, children continue to struggle with certain features of the system (Schick, 2003).

Studies focusing on children who have received CIs reveal similar patterns. Bimodal bilingual children (who are exposed to both speech and sign language) outperform speech-only children on measures of language fluency and gestural expression and are no different on measures of receptive vocabulary, social and communicative skills, visual reception, auditory and visual association, visual closure, and visual/auditory sequential memory (Jiménez et al., 2009). It is important to note that when assessing the language abilities of bimodal bilingual children (such as DHH children who use spoken language and sign language), assessing both languages is vital. Assessing only one of those languages (e.g., spoken language) provides a limited picture of language proficiency (Peña et al., 2016). With limited information about the sign language abilities from these studies of individuals who use CIs, little can be determined about their global language abilities across both languages. Nevertheless, several studies support the idea that, as long as sufficient spoken language exposure is provided to the children, they will be able to develop spoken language abilities, particularly for those implanted younger than 5 years of age (Connor et al., 2000; Spencer & Marschark, 2003). Furthermore, evidence shows that early exposure is critical for achieving full fluency in ASL (for a review, see Tomaszewski et al., 2019). For example, age of exposure to ASL influences acquisition of ASL syntax as well as semantic and phonological performance in the form of analogies (Henner et al., 2016).

Some evidence suggests that certain speech production or auditory outcomes may be better for children who are only exposed to spoken language (and not sign language). For example, studies have reported that speech production or auditory skills tend to be better for children who are exposed only to speech than for children who are exposed to

both speech and sign language (e.g., Dettman et al., 2013; Percy-Smith et al., 2010); however, overall language and social/emotional skills may be better supported by bimodal bilingual language use (e.g., Swanwick & Tsvetik, 2007). Another study found that the speech-only children performed better only on speech intelligibility, auditory reception, and grammatical closure than did those exposed to both speech and sign language (Jiménez et al., 2009). Therefore, there may be some auditory perception or speech production abilities that possibly develop more quickly for speech-only children than bimodal bilingual children, but with sufficient exposure to spoken language, bimodal bilingual children appear to eventually gain sufficient spoken language mastery (e.g., Spencer & Marschark, 2003).

Furthermore, Sharma et al. (2002) showed that there is a sensitive period for auditory pathway development, suggesting that auditory input is important following cochlear implantation and that this sensitivity can be lost without access to spoken language. This does not, however, indicate that continued sign language use would be detrimental to overall language outcomes, but rather that auditory access is also important. As the evidence from Davidson et al. (2014) indicated, children with CIs who were exposed to full ASL before and after receiving their CI (due to having at least one deaf parent) demonstrated age-appropriate language skills. These language skills were likely supported by the continued language development maintained by ASL while they also were learning spoken language during the post-CI period. While some children appear to have better listening outcomes if only exposed to speech, it is important to consider overall language development and communicative ability. In the same vein as with spoken language bilingual children, you cannot determine a child's complete speech or language abilities by examining only one of their languages. Similarly, with bimodal bilinguals, it is important to consider all of their language and phonological systems and development.

Additional studies examine language outcomes in addition to auditory and speech production outcomes. For example, Geers et al. (2017) report that children with CIs, who were not exposed to any sign language, performed better than those exposed to sign language on speech intelligibility ratings. Additionally, they found that the CI speech-only groups also outperformed the long-term sign-exposed group on measures of spoken language and reading comprehension outcomes. However, for this study, they did not differentiate between those exposed to a full visual language, such as ASL, and those exposed to baby sign or MCE. The nature of the visual language/system input is important as previously discussed (e.g., Schick, 2003). Furthermore, if parents reported exposure to sign language at least 10% of the time, their child was labeled as "exposed to sign." It is important to remember that a child who is exposed to sign 10% of the time is exposed to spoken language for the vast majority of their day (90%), leading to questions of why the exposure to spoken English for the vast majority of the time is not resulting in gains. Additionally, questions of causality remain: Do those families use sign language because spoken language is not working

for their child, or is spoken language being negatively impacted by sign exposure? The data presented in this article are not sufficient to draw conclusions on causality. Therefore, the results should be interpreted with extreme caution as their methodology conflates too many factors to support their main conclusions. See M. L. Hall et al. (2019) for additional discussion on this topic.

An additional issue to consider is that many deaf children also have additional disabilities (Mitchell & Karchmer, 2004). Some of these disabilities are not apparent at birth and might surface as language disorders, cognitive or intellectual impairment, or reading disabilities at preschool ages or even older. For those with additional disabilities, their ability to access and use spoken language has been reported to be at a lower success rate than those who are only deaf or hard of hearing (Hitchins & Hogan, 2018). For individuals relying exclusively on spoken language, if they have later-discovered disabilities, parents and educators have lost valuable years of instruction by the time the disability is discovered; however, for those children who are exposed to both speech and sign language from birth, there is no window of lost language exposure.

When discussing language access for deaf children using CIs, there are several special considerations that need to be taken into account. The first is that even the best equipment will at times break and need repair or be lost. Language access is still important even during times that the equipment is being serviced or replaced. While some families will have older, back-up equipment to rely on in these circumstances, it is not guaranteed, and as professionals, we should not assume this to be available for every family. Similarly, the process of implantation can take several months from implantation to activation, and the current guidelines for implantation are generally restricted to infants 12 months or older (Houston et al., 2020). These periods represent critical time lost for language input and academic access. An additional consideration is that active listening is cognitively and physically fatiguing for DHH children (Bess & Hornsby, 2014; reviewed in Rhoades & Glade, 2020) and they may choose to take a "listening break" after a long day but can still remain connected and in communication with others via a signed language modality. Finally, perceiving speech in the presence of background noise has been shown to be extremely difficult (Caldwell & Nitttrouer, 2013), and in this situation, access to a visual language ensures full comprehension.

In a time when linguistic diversity is encouraged and considered an asset, it is astonishing that many professionals in the field of deaf education, speech pathology, and audiology still adhere to outdated beliefs about bimodal bilingualism for DHH children. Evidence from typical and atypical language and academic development (e.g., Paradis, 2007; Worthy et al., 2013) supports a bilingual approach to language acquisition, particularly for early exposure to a second language. Furthermore, evidence directly from deaf individuals supports the benefits of ASL exposure on acquiring spoken language (Preisler et al., 2002) and written language (Strong & Prinz, 1997).

Future studies must ensure clear labeling and measurements of all languages that a DHH child knows. Additionally, it is vital for accurate interpretation of the data to have clear descriptions and delineations between participants who are exposed to full, grammatical ASL and those who are exposed to baby sign or MCE systems because, as we have pointed out in this article, these are not treated the same by the brain. Finally, it is important for future studies to carefully examine the auditory and speech production skills of children with CIs as well as their overall language abilities and mental/social health, including group identity and self-esteem. We cannot view this children's auditory access in a vacuum; it is a portion of who the child is linguistically, socially, and emotionally, and future studies must account for these other aspects of a child's development.

Exposing a child to an additional language is beneficial for linguistic and cognitive growth, and for deaf children who may not have consistent access to high-quality sound through their CI or hearing aid, there is much to be lost in terms of language deprivation by not exposing them to accessible language (e.g., M. L. Hall et al., 2019; W. C. Hall, 2017). It is time for every individual to examine their own biases in relation to communication access for deaf children in light of the evidence. 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." Our students, clients, and children deserve careful examination of the evidence. The argument is no longer "spoken language or sign language" but "spoken language and signed language" for deaf individuals pursuing spoken language.

Author Note:

Person-first language, while standard for health care professions, is not preferred for the Deaf signing community. Therefore, we have chosen to follow identity-first language in keeping with the preferences of the community and according to ASHA (ASHA Journals Academy, n.d.) and APA guidelines (American Psychological Association, 2020).

Author Contributions

Kristen Secora: Conceptualization (Lead), Writing - Original Draft (Lead). **David Smith:** Writing - Review & Editing (Supporting).

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