Position Statement On Early Cognitive and Language Development and Education of Deaf and Hard of Hearing Children

- Declaración de posición sobre el desarrollo temprano cognitivo y lingüístico y la educación de niños sordos e hipoacúsicos (https://www.nad.org/declaracion-de-posicion-sobre-el-desarrollo-temprano-cognitivo-y-linguistico-y-la-educacion-de-ninos-sordos-e-hipoacusicos/)

Context Requiring Action

Young deaf and hard of hearing children continue to experience delayed cognitive and language development in early childhood that lead to academic difficulties and underperformance when they begin schooling. Despite the good intentions of government, schools, and professionals, this condition persists, resulting in significant under-education and underemployment for persons who are deaf or hard of hearing. The effects of early language deprivation or limited exposure to language due to not having sufficient access to spoken language or sign language are often so severe as to result in serious health, education and quality of life issues for these children.

Position on Early Childhood Development and Education for Deaf and Hard of Hearing Children

The period from birth to 2 is a critical time for the acquisition of language and cognition for all children, and this period of time is often when deaf and hard of hearing children are deprived of processes that promote healthy language development (Humphries et al., 2012). Until recently, the view of those in science, society, and education has been that these children will be severely disadvantaged because they lack access to auditory input and therefore auditory language exposure, even if deficient, is the best pathway to resolve this disadvantage. However, recent evidence from multiple studies shows that profoundly deaf children possess high levels of language organization if they had early exposure to a visual language. Signed or visual languages are naturally evolved languages of which there are many throughout the world. ASL is the signed or visual language that is prevalent in the United States and is the subject of much of the research discussed in this paper.

During this period of early life, many deaf and hard of hearing children are, sometimes unintentionally and unknowingly, unable to access the language of their families or peers because this language is not in a visual form. In the absence of a visual language such as American Sign Language (ASL), the risk of harm from language deprivation is heightened and their cognitive capacities are reduced. Language deprivation is the harm that results when a child does not receive sufficient language input to acquire or learn any language or readily develop cognitive capabilities. The presence of a signed language from birth greatly reduces this risk of harm (Humphries et al., 2012).

Studies have shown that early exposure to visual language changes visual processing and heightens skills in joint-attention. Children with early exposure to sign language frequently shift eye gaze, which leads to early vocabulary development. From data collected in naturalistic contexts, deaf signing teachers and caregivers actively engage, manage and direct the visual

attention of deaf children (Crume & Singleton, 2008; Lieberman, 2008). These studies, among others, show that by the age of 4, deaf children who use ASL are able to self-regulate attention to a visual language. Their self-regulation is achieved by careful and constant orchestration of visual gaze and engagement on the part of the adult, especially in contexts involving competing visual input such as book sharing. Among the deaf toddlers studied by Lieberman (2008), a strong correlation was found for the number of appropriate and successful visual bids for communicative attention and the child's score on an ASL vocabulary inventory (Anderson & Reilly, 2002).

While skill in visual attention among deaf children learning sign language may not be a surprising result, it dovetails with recent work showing the significant role of visual gaze and attention in hearing children's development of spoken language processing skills. Early visual skills, particularly the ability to quickly find a picture in an array, predict later reading performance (Fernald, 2008). Rapid visual response is an early indicator of the child's ability to make predictions about language input that aids in comprehension skills needed for reading. The early appearance of visual attention along with timely visual language input (ASL) in deaf children likewise contributes to their reading and written language development (Chamberlain & Mayberry, 2000; R. Mayberry, del Giudice, & Lieberman, 2011). It appears that visual learning, which develops along with visual language, is crucial in this correlation.

Early visual language socialization of deaf children results in unique adaptation of, and possibly accelerated, visual and joint attention capacities (Harris & Chasin, 2005; Mather, 1990; Waxman & Spencer, 1997). Unlike hearing children, object exploration and receiving caregiver linguistic input in deaf children requires *sequential* or *alternation* of gaze, which can be hypothesized to be a more demanding type of visual attention. These demands may also lead to accelerated development of executive functioning and language development (Corona & Singleton, 2009).

Investigation of each caregiver's behaviors that elicited and sustained the child's visual attention as well as the child's developing repertoire of self-regulatory attention strategies, especially in the context of book-sharing, is instructive in this regard (Lieberman, Hatrak, & Mayberry, 2011). The child's ability to alternate gaze between pictures and language input during joint storybook reading sets the basis for the acquisition of literacy skills. Managing divided visual attention between signed language input and English print on the page has long been thought to be a particularly effective bilingual strategy of deaf signing mothers with their deaf babies.

Studies on bilingualism show greater advantages in areas of cognitive benefits, metalinguistic awareness, and enhanced executive functions such as problem solving, attention control, and task switching (Bialystok, 1999; Bialystok, Craik, Green, & Gollan, 2009; Hauser, Lukomski, & Hillman, 2008)The age of first language and first bilingual (ASL and English) language exposure has a powerful impact on the deaf and hard of hearing child's ability to develop complex reading knowledge (Berens, Kovelman, & Petitto, 2013; Jasinska & Petitto, 2013).

The persistence of belief that reading a spoken language like English must logically require awareness of phonological coding of English has distracted from consideration in deaf education of the possibility that there are other efficient pathways for deaf children in learning to read. To be clear, deaf children do develop phonological awareness in both spoken and signed languages (Crume, 2013; Hanson & Fowler, 1987; McQuarrie, Abbott, & Spady, 2012). In a meta-analysis of research studies examining spoken language phonological coding abilities in deaf students educated in a variety of communication modes (i.e., speech only, speech and sign, sign primary), Mayberry et al.'s analysis demonstrated that spoken language phonological coding only predicts about 10% of reading outcome. Specifically, they found two factors correlated with reading achievement: ASL fluency and exposure to print. However, the correlation between print exposure and literacy **only holds when in the presence of ASL fluency**. While spoken language phonological coding may not predict reading ability very well in deaf children, signed language phonological coding is a stronger factor in development of reading ability. These findings suggest that an emphasis on visual language development activities as a path to successful reading acquisition may serve as a better model of literacy development for deaf children.

A number of case studies that have explored bilingual language development, with particular emphasis on the effect of early sign language acquisition on the development of spoken language found that early sign language acquisition does not prevent deaf children from learning vocal language (Davidson, Lillo-Martin, & Pichler, 2014). Importantly, use of sign language from an early age does not inhibit the motivation and interest in the learning of speech (Swanwick, 2001). An earlier study of CI children who are fluent in ASL found that signed language fluency does no harm and may contribute to spoken language development by avoiding the effects of early language deprivation (Vasquez, Pease-Alvarez, & Shannon, 1994).

A study of six bilingual children found that both a baby girl acquiring spoken French and English simultaneously and a baby boy, who was acquiring spoken French and Quebec Sign Language (Langue de Signes Quebecoise – LSQ), achieved classic linguistic milestones and exhibited patterns of lexical growth that were consistent with monolingual norms (L. A. Petitto et al., 2001). Yet another study concluded that young bilinguals were not delayed in the achievement of early language milestones in either of their respective native languages. This study reported no dramatic delays or asynchronies were observed in the timing of the bilingual children's achievement of the linguistic milestones across either the spoken or signed modalities Further, there was no bias or preference for speech in these hearing babies, as both languages (LSQ and French) in both modalities (signed and spoken, respectively) were learned equally (L. A. Petitto & Holowka, 2002). This finding indicates that both modalities are viable pathways for language acquisition.

Moreover, research studies emphasize the importance of fingerspelling for reading. Children's ability to understand fingerspelled words was found to be strong predictors of reading ability (Padden, 1996; Padden & Ramsey, 1998a). These studies suggest that: early fingerspelling exposure helps deaf children become better readers; fingerspelling and literacy development are interrelated; and fingerspelling facilitates vocabulary growth.

A number of studies have demonstrated associations between fluency in ASL and reading achievement (Hoffmeister, de Villiers, Engen, & Topol, 1998; Padden & Ramsey, 1998b; Prinz & Strong, 1998; Singleton, Supalla, Litchfield, & Schley, 1998). Learning to read and write English remains an important educational component for deaf children, and fluency in ASL is linked to literacy and their linguistic, cognitive, and cultural development. When controlled for other factors, these studies and others showed that fluency in ASL predicts reading achievement. (Chamberlain & Mayberry, 2008). With the link between ASL and English literacy, the basis for visual language in the development of literacy in deaf and hard of hearing children is clear.

Another source of research support for the importance of visual language and visual learning is suggested by the link between deaf families and English literacy in their children: the role of culture in learning. Hypothesizing that deaf families must be doing something in their daily lives that produces bilinguals able to read and write in English, a number of researchers focused on what happens between signing deaf adults and deaf children in deaf families and communities. These studies identified specific cultural practices and the ways that deaf people link ASL and

English in everyday lives, such as: the specific ways deaf mothers sign to their deaf babies (Blumenthal-Kelly, 1995); the use of eye gaze to regulate deaf children's attention getting and turn-taking (Mather, 1990); the acquisition of fingerspelling—a component of ASL—by deaf children and how it corresponds to the acquisition of print (Padden, 1991); the associative skills that link ASL fluency and reading (Padden & Ramsey, 1998a); and the ways that linking ASL and English migrate into the classroom with deaf teachers (Humphries & MacDougall, 2000). For this reason, early childhood is a crucial point in the education of deaf children. It is here that support for families and support for the child between home and school begins. It begins with clarifying whole-child development to parents—including language (both ASL and English), social, cultural, literacy, and behavioral development.

Listening technology is often beneficial to deaf and hard of hearing children, with augmented hearing aid systems and cochlear implants playing a role in the development of spoken language. However, as discussed earlier, spoken language development can be enhanced if sign language is also present. Hearing aids have been acceptable and effective listening devices and cochlear implants can, in some cases, be important in the development of spoken English. However, these technologies and devices vary greatly in their linguistic benefit to individual deaf and hard of hearing children. Humphries, et al (2012a) argue that due to a cavalier treatment of the importance of keeping this kind of data on linguistic benefit, only informed estimates can be made. Such informed estimates indicate that no more then 40 percent of deaf and hard of hearing children who have cochlear implants but do not use sign language get a linguistic benefit from the device. Unfortunately, the remaining 60%, an unacceptably high number (even 5% is too much), are at risk of linguistic deprivation when they are given cochlear implants and speech only exposure to language (Davidson et al., 2014).

Reliance on only spoken language input via cochlear implants may result in linguistic deprivation if sign language is excluded from the environment of the child. Put simply, if the child is only provided linguistic input through speech and hearing and the CI does not provide the child clear and unambiguous access to this input, language learning is compromised. Often medical and audiology professionals counsel parents to deprive deaf and hard of hearing children (especially those who are implanted) of exposure to sign language input. This advice to parents arises from a profound misunderstanding about languages, language development, and signed languages. This advice often leads to delayed language development and limited communication in the home and educational planning that does not acknowledge that the lack of progress in all areas

of the school curriculum. If listening technology and speech are used with deaf and hard of hearing children, it is critical that signing also be used in a bilingual, bimodal environment. It is important to note that bilingual language exposure does not confuse children (Christiansen & Barnartt, 2003; Crume, 2013; Humphries, 2013; R. Mayberry, 1993; R. I. Mayberry & Eichen, 1991).

Deaf and hard of hearing children like all children have a right to language. Signed language, being a visual language, is the only completely accessible language for these children. Exposure to signed language from the onset is the only way to ensure this right. (Davidson et al., 2014; Siegel, 2008). Language is essential to education and the education of deaf and hard of hearing children is no exception. Sign language is not only a necessity to ensure a normal cognitive development, language acquisition, and future academic success, but it is also shown to be biologically equivalent to spoken language (L. Petitto et al., 2000). Hope for improvement in the education of deaf and hard of hearing children lies in early exposure and development of signed language fluency. To achieve full participation in American life, deaf and hard of hearing children and youth will need two languages, English and ASL. Development of both English and ASL must begin as early as possible for every deaf and hard of hearing child.

Required Action

Research has shown that thousands of deaf and hard of hearing children are experiencing various levels of language deprivation, many to an extent that constitutes harm in the form of educational, social-emotional and cognitive delays. For this reason, it is the position of the National Association of the Deaf that an all-out effort needs to be made to ensure that all deaf and hard of hearing children have full and meaningful access to language from birth and the benefit of visual language and visual learning. All institutions and individuals in the health, education, and child care professions need to be educated on the visual language needs of all deaf and hard of hearing children. It is the responsibility of government agencies such as federal and state Departments of Education and Departments of Social Services to develop safeguards to ensure that every deaf and hard of hearing child is progressing on a developmental path commensurate with children who hear. Federal and state health agencies and disease control agencies have a responsibility to recognize the epidemic nature of language deprivation of deaf and hard of hearing children, including therapies and treatments that have unacceptable failure rates and unpredictable results. There must no longer be excessive reliance on hope and tolerance of high risk that are not acceptable in other health and education contexts.

The National Association of the Deaf further encourages the development of legislation to ensure age appropriate language acquisition and development in every deaf and hard of hearing child from birth. Laws and regulations that make clear that deaf and hard of hearing children have a right to language from birth through visual language, need to be legislated and enforced. The National Association of the Deaf asserts that the right to a natural, visual language is a human right of all deaf and hard of hearing children.

Sources and Citations

Note: Research, key concepts, and, even text was drawn from many sources. The citations made are selected ones, there are many others that are equally supportive of the positions taken in this position paper.

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