Augmenting Sign Language Exposure for Hearing Parent-Deaf Child Interaction

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Above 90% of deaf children are born to hearing parents who are often non-fluent with sign language. The developmental consequences of early language deprivation experienced by deaf children can be witnessed in their later life outcomes. A significant portion of the deaf population are prone to cognitive delays, poor educational experiences, diminished career opportunities, and psychosocial difficulties (Hall 2017, 961). Given this, it becomes imperative to improve early childhood language experiences. To foster neuropsychological growth, language must be accessible to the child; in the case of deaf children, this would mean early exposure to a visual language.

There are two main challenges for hearing parents to offer linguistic-rich interaction with their DHH children. First, the learning curve of ASL makes it difficult to accommodate the infant’s critical language acquisition window. Second, the mismatch in communication modalities between the hearing parent and deaf child causes insufficient communication strategies for the child’s linguistic intake. Adjusting to utilizing a single visual modality to deliver language is a new situation for hearing parents who are accustomed to using spoken communication. In contrast, deaf parents, who tend to be fluent signers, intuitively adapt communicative behaviors that support the child’s visual attention (Spencer and Koester 2016, 183). With these in mind, we developed the following research questions: (1) How to develop assistive technologies that support hearing parents to carry out just-in-time and situation-aware ASL to their DHH child? (2) How to develop assistive technologies that support hearing parents to adapt to sufficient joint attention strategies for linguistic intake for their DHH child? (3) How to develop assistive technologies that support non-intrusive face-to-face interaction?

I. SYSTEM PROPOSAL

As an initial step to address the above research questions, we propose a proof-of-concept prototype using projection-based augmentation technology that aims to enhance joint free play episodes between hearing parents and their DHH child. The main goal of the prototype is to support real-time, context-aware, and non-intrusive ASL-based interaction, with adaptation to joint-attention strategies that match with the child's communication modality. It does so through the projection of on-demand ASL vocabulary videos next to the child’s object of visual attention. The ASL labeling will promote the parent’s sign language learning, while also serving as a visual feedback cue on child’s eye gaze. Our target infant population is between 6 to 18 months of age. We chose this as our focus age group since it’s during this time period that infants are learning social communicative behaviors that aid in language development (Carpenter et al. 1998, 176).

Fig. 1. Projection of words apple, fork and blue.

In this talk we’ll discuss about our design concept and delve into our user-centered approach, in which we are aiming to conduct a formative study to solicit feedback on our proof-of-concept prototype and pilot our survey for future design iterations.

II. REFERENCES

