June 16, 2017

Dear Drs. de Haan, Nelson, and Quinn

We are pleased to submit an original research article entitled *Real-time lexical comprehension in young children learning American Sign Language* for publication in *Developmental Science*.

Finding meaning in a spoken or signed language is a fundamental skill that requires learning to establish reference during real-time interaction – relying on audition to interpret spoken words, and on vision to interpret manual signs. Earlier studies have used children’s gaze to index the time-course of spoken language comprehension (e.g., Fernald et. al., 2006), demonstrating continuities between variation in real-time processing efficiency in toddlers and later language outcomes (Marchman & Fernald, 2008). The importance of real-time language processing has also been shown in diverse populations of Spanish speakers (Weisleder & Fernald, 2013) and pre-term children (Marchman et al., 2015). Do the findings from spoken language reflect language-general phenomena or are they specific to the auditory modality? Until now, no previous research has characterized language processing skills in young children learning a *visual* *language*.

Here, we address this question by developing the first measures of speed and accuracy in real-time *sign* *language* comprehension by children learning American Sign Language (ASL). We show that young ASL learners rapidly shift visual attention as soon as they have enough of the linguistic signal to do so. In addition, individual variation in speed of lexical access is meaningfully linked to age and vocabulary, highlighting parallels between signed and spoken language development when children are exposed to native sign input. We also show that deaf and hearing ASL learners process ASL in qualitatively similar ways, suggesting that these skills are driven by experience with a visual language, and not by deafness.

We believe that this research is worthy of publication in *Developmental Science* because this is the first study to use high-resolution, eye-tracking measures to assess language development in young visual language learners. It is also the first study to characterize the looking behavior of both native deaf and hearing children as the process ASL in real-time. While there have been small, diary studies of language production in these populations, the development of these precise quantitative measures lays the foundation for future work exploring parallels and differences between the psycholinguistics of visual and spoken languages.

Finally, this is the first study to show parallels between the development of real-time spoken and sign language processing in the first years of life. The striking parallels suggest that processing efficiency is a skill fundamental to language learning regardless of language modality. We think these findings will be of interest to readers interested in basic human cognitive processes, as well as those who study language development, sign languages, deafness, and language comprehension.

This manuscript has not been published and is not under consideration for publication elsewhere. Please note that Amy Lieberman and Arielle Borovsky were both students with Dr. Fernald at Stanford, and that Dr. Fernald serves as a consultant on an NIDCD grant with Rachel Mayberry, so there would be a potential conflict of interest if Drs. Lieberman, Borovsky, or Mayberry served as reviewers. Other possible reviewers with deep expertise in language development in ASL (all unfamiliar with this research) include Karen Emmorey, Rain Bosworth, Jennie Pyers, or any of the faculty at Gallaudet University such as Laura-Ann Petitto or Thomas Allen.

Thank you for your consideration.

Sincerely,

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