COVID-19 Related Changes to Language Environment and Development for Deaf and Hard-of-Hearing Children

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Background

Children who are deaf and hard-of-hearing (DHH) experience variability and delay in their language outcomes (Boons et al., 2013).

Our lab focuses on early environmental factors that contribute to spoken language development, and can help explain variability in language development, in DHH children with cochlear implants (CIs) and hearing aids (HAs).

Parental Language Input

There is a link between quantity and quality of parental speech and spoken language outcomes (Ambrose et al., 2014; Gilkerson et al., 2018).

This spoken language input factor is likely especially important for DHH children with CIs and HAs, since they have experienced auditory deprivation during a sensitive period for development and because more complex acoustic environments may prove more challenging for them to parse through their respective devices.

The COVID-19 Pandemic

The COVID-19 Pandemic affected the dynamics of home language environments (Cooke et al., 2021) as families were impacted by temporary work-from-home policies and stay-at-home orders (Alon et al., 2020) and parents may have experienced heightened stress (Qiu et al., 2020).

Research Questions

1. How has the COVID-19 pandemic impacted early language environments of DHH children with CIs and HAs in the two years since its onset?
2. Have these changes begun to affect language outcomes in DHH children with CIs and HAs?

Methods

LENA®

Building brains through early talk

- Participants in our research complete day-long LENA (Language ENvironment Analysis) recordings.
- LENA automated analysis of adult word count (AWC) and conversational turn count (CTC) serve as quantitative measures of early language input.
- Measures are normalized by hour of recording time (AWC/hr, CTC/hr) and averaged to account for variation in number of recordings by family and length of recordings.

LENA Participants

- *Pre-Pandemic:* 304 recordings from 42 families of DHH children (22 CI, 20 HA)
- *During-Pandemic:* 38 recordings from 16 families of DHH children (4 CI, 12 HA)

PLS-5 Preschool Language Scales—Fifth Edition™

- Standardized outcome measures of expressive communication, receptive comprehension, and total language are obtained using the Preschool Language Scales: Fifth Edition (PLS-5), which is administered clinically or in our lab.

PLS-5 Participants

- *Pre-Pandemic:* 109 administrations to 50 DHH children (22 CI, 28 HA)
- *During-Pandemic:* 35 administrations to 23 DHH children (11 CI, 12 HA)

Results

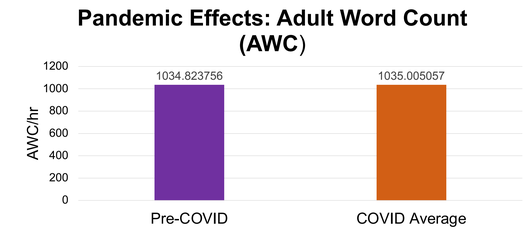

Figure 1: Average adult word count (AWC) per hour before and during the pandemic (pre-pandemic: 1034.82; during pandemic: 1035.01)

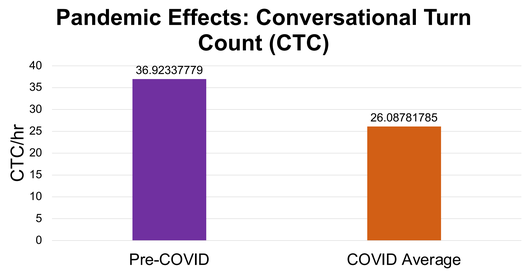

Figure 2: Average conversational turn count (CTC) per hour before and during the pandemic (pre-pandemic: 36.92; during pandemic: 26.09)

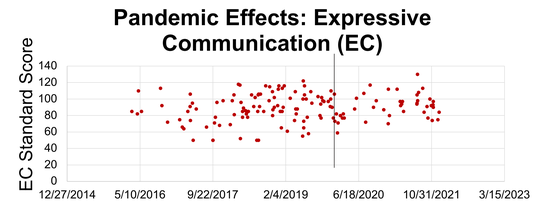

Figure 3: Expressive communication (EC) standard scores across time. A linear mixed-effects model showed a significant effect of the pandemic on EC (p=0.005**).

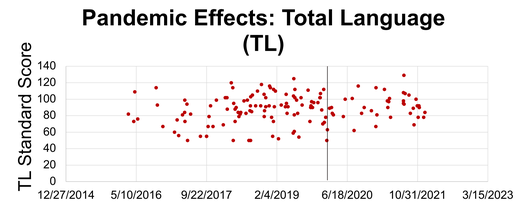

Figure 4: Total language (TL) standard scores across time. A linear mixed-effects model showed a marginally significant effect of the pandemic on TL (p=0.018*).

Discussion

- The LENA findings suggest that while the quantity of adult language input in the environment may have been relatively unchanged during the pandemic in the longer term, there was a persistent decline in parent-child interactions since the onset of the pandemic, which could prove detrimental for language development.
- The PLS findings suggest that pandemic-related changes to early language environments may be beginning to affect language outcomes.
- Together, these findings illustrate how early language environments and language development are closely related and are suffering due to the ongoing crisis of the COVID-19 pandemic.

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