Impact of moderate prematurity on early speech perception and minimal-pair word-learning, preliminary results from a 2-year longitudinal study

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Around 15 million children are born prematurely every year, and most of them are moderate preterms (born between 32 and 36 weeks; WHO, 2023). Prematurity has long-term negative effects on cognitive and language outcomes (De Jong et al., 2015; Gervain, 2015). Indeed, compared to full-term newborns, moderate preterms show impaired cortical encoding of speech sounds (François et al., 2021). Here, we present preliminary results of a longitudinal study examining the impact of moderate prematurity on early speech perception and vocabulary acquisition from birth to 24 months. We use EEG recordings and eye-tracking data to investigate the relationship between early auditory perception and language learning abilities. EEG recordings of cortical and subcortical responses are collected simultaneously during a passive listening task (Bidelman, 2015). Specifically, blocks of high stimulation rate (3.45 Hz) alternated with blocks of low stimulation rate (1.47 Hz) to allow the analysis of the Frequency Following Response and the Mismatch Negativity, respectively. These data will enable us to examine the auditory hierarchy of speech perception during early development. We also collect eye-tracking data to explore infants' associative word-learning abilities during a word-learning task involving two pseudo-words, forming a minimal pair based on a voice onset time (VOT) distinction of the initial consonant. Combining electrophysiological, behavioral, and neurodevelopmental measures will allow us to better understand the complex relationship between early speech perception and vocabulary acquisition and evaluate the impact of prematurity. The results of our study will help identify early biomarkers of language delay in moderate preterm infants, paving the way for essential early interventions.