Contribution ID: **31** Type: **Poster**

Investigating speech and cries in the baby brain with fNIRS

Newborns show sophisticated speech perceptual abilities already at birth, especially for speech over other sounds. But how does the brain process cries, the only vocalizations newborns can produce? We tested 70 newborns and 38 adults using functional near-infrared spectroscopy (fNIRS), measuring their brain activation in the bilateral temporal, frontal, and parietal areas while they were listening to newborn cries and adult speech sentences. In both groups speech elicited activation in left temporal areas, regions known to process speech and other auditory input. Additionally, we found evidence of heightened motor activity in response to cries in newborns, and in response to both cries and speech in adults. These findings not only shed light on neural mechanisms of early speech perception, but also demonstrate the potential and the methodological challenges of using fNIRS in neonatal research.

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Session Classification: Poster Session