

# **Newborns' neural tracking of infant-directed and adult-directed speech in native and foreign language**

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The human brain is tuned to spoken language already at birth.<sup>1,2</sup> Moreover, shortly after birth, infants can distinguish their mother's language from unfamiliar languages and have enhanced responses to familiar over unfamiliar rhymes.<sup>1,3</sup> In behavioral studies, infants prefer to listen to infant-directed speech (IDS) to adults-directed speech (ADS) most robustly in their native but also in a foreign language<sup>4</sup>. Recent studies demonstrated that this preference has correlates at the neural level.<sup>5,6</sup> Studies testing neural responses to speech in infants mostly use IDS stimuli<sup>7</sup>, but it is debatable whether IDS (compared to ADS) preserves, exaggerates or diminishes prosodic differences between languages. In the present experiment, we test whether newborns show differential neural tracking of a native over a foreign, rhythmically different, language, and whether the language effect is more/less prominent in IDS or in ADS. We assess the neural tracking of native and non-native speech in newborns (aged 1–5 days) of Czech-speaking mothers (intended n = 60, collected n to date = 27). Newborns' neural activity was recorded in sleep, from 6 EEG channels. Each infant listened to natural recordings of a children's story in two rhythmically different languages, Czech (lacking acoustic cues to word-level stress) and Russian (with acoustically salient word-level stress), in IDS or ADS. We predicted that newborns would exhibit more accurate and/or stronger neural tracking of Czech, their native language, evident in larger inter-trial phase coherence (ITC), and total power, respectively. Figure 1 shows preliminary ITC data. This language-specific effect would be prominent specifically in the theta band corresponding to the syllable rate (acoustically prominent) and less so in the delta band corresponding to the word rate (not acoustically prominent). We further tested whether this native-language effect would interact with speech style, i.e. ADS vs. IDS. So far, we collected data from 27 infants, and at the workshop we will present preliminary results from the complete sample.