

## Neural attunement to native vowels across preterm and fullterm newborns

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While newborns can recognize their mother's voice and native language, there might be more to intrauterine language development than tuning in to the global language patterns: prenatal learning seems to pertain even to smaller-sized structures such as individual vowels and syllables (Partanen et al. 2013 PNAS). While behavioural and neuroimaging literature reports various language-specific abilities at birth (Mampe et al. 2009 Curr Biology, Moon et al. 2013 Acta Paediatrica, Abboub et al. 2016 Brain Lang, May et al. 2018 Dev Sci), it remains unknown when exactly the attunement to native linguistic patterns sets on. Here we aimed to test at what gestational age the newborn cortex distinguishes between minimally contrastive native-language syllables. EEG in response to naturally-produced vowels was recorded and analysed from a total of 99 infants, born between the 32th and 42th gestation weeks, who were tested a few days after birth (mean = day 3, range 1 to 16 days). Infants were assigned to one of two conditions: the durational condition with the [ε]-[ε:] contrast, and the spectral condition with the [ε]-[a] contrast, both representing a phonemic change in Czech, the infants' native language. We analysed the amplitude of primary ERPs to vowel onset and offset as well as the amplitude of the mismatch response (MMR). Linear mixed-effect modelling revealed that the sensory processing of the acoustic vowel differences, indexed by reliably different onset and offset ERPs, develops earlier for the durational than for the spectral contrast, at 38w4d GA and 39w2d GA, respectively. A reliable MMR response was found for the durational contrast across preterm and fullterm ages, and interestingly, shifted from a positive pMMR, in the youngest preterm infants to a negative nMMR, in the oldest fullterm infants. These newborn findings are in line with perceptual development in Czech-learning infants in the first year of life (who have more robust processing of vowel duration compared to spectrum), as well as with the characteristics of Czech (prenatal) IDS (which exaggerates duration contrasts).