Can infants' brains generalize a primed meter across different tempos?



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INTRODUCTION

- **Rhythm perception** has been implicated in early language acquisition and prosocial behaviours.¹⁻³
- Rhythm processing deficits are often correlated with developmental disorders.⁴⁻⁶

Rhythm: ta-ta-ta-ta-ta | ta-rest-ta-ta-ta-rest



DISCUSSION

CONCLUSIONS

MMR: May be MMR present, at least in triple group

- Encouraging since only 4 participants in triple group so far
- No clear MMR in duple group yet (n=2)
- Priming effect not yet clear



To investigate if infant top-down meter perception is generalizable across different tempos, we used two electroencephalography (EEG) measures...

Mismatch Response (MMR)

 An event-related potential evoked by an unexpected (oddball) sound

Previous work done in our lab (Flaten et al., 2022):

- 6-month-old infants (N=24)
- 6-beat piano tones
- 300 ms inter-beat interval (IBI)
- Higher MMR amplitude for deviants at the strong beat position as opposed to the weak beat
- Priming effects stronger in duple group, perhaps due to enculturation to duple-biased Western music



• Expect to replicate findings of Flaten et al., 2022

ITPC: Phase coherence at the beat frequency for both groups upon visual inspection

- Potential triple peak in triple group
- No clear peaks in duple group

Duple Bias: Unclear so far, but if it exists, may be due to enculturation to duple-biased Western music

Next Steps: Continue collecting data to increase statistical power

IMPLICATIONS

- Findings may improve understanding of infant auditory development, social development and developmental disorders
- Implications for early language acquisition: topdown meter perception may be associated with processing of word-level speech structures⁹

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Intertrial Phase Coherence (ITPC)

RESEARCH AIMS:

- Measures consistency of the phase angle of the rhythmic brain, at stimulus frequencies, across trials
- After exposure to trisyllabic pseudo words, infants' ITPC for the frequency of word-like units increased logarithmically over time relative to their ITPC at the frequency of isolated syllables⁹

Preliminary ITPC Findings, Midline Frontal (FZ) Region

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1. Find out whether MMR in Flaten et al., 2022

can be replicated across various tempos.

2. To see if infants demonstrate higher ITPC at

the frequency of the primed meter.

3. Secondarily, investigate whether duple bias in Flaten et al., 2022 remains in the new data.



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