

Infants track the rhythms of speech and song

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Introduction

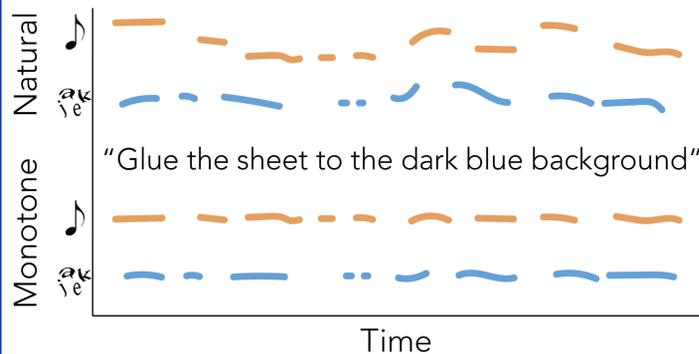
Infants are drawn to the musical features of infant-directed (ID) speech (e.g., Fernald, 1989). Infants and adults learn language more quickly from ID speech and song compared to adult-directed utterances (Thiessen et al., 2005; Schön et al., 2008).

Musical structure may help listeners neurally track syllable onsets, which could relate to better learning from musical features in speech.

Our study used cerebro-acoustic phase coherence as an index of syllable-rhythm tracking of speech (VBdN et al., 2020). This is one of the first demonstrations of low-frequency phase-locking in 4-month-olds.

Method

Pitch tracing of utterances



32 infants and 20 adults passively listened to spoken and sung natural and monotone versions of the children's stories "George and Martha".

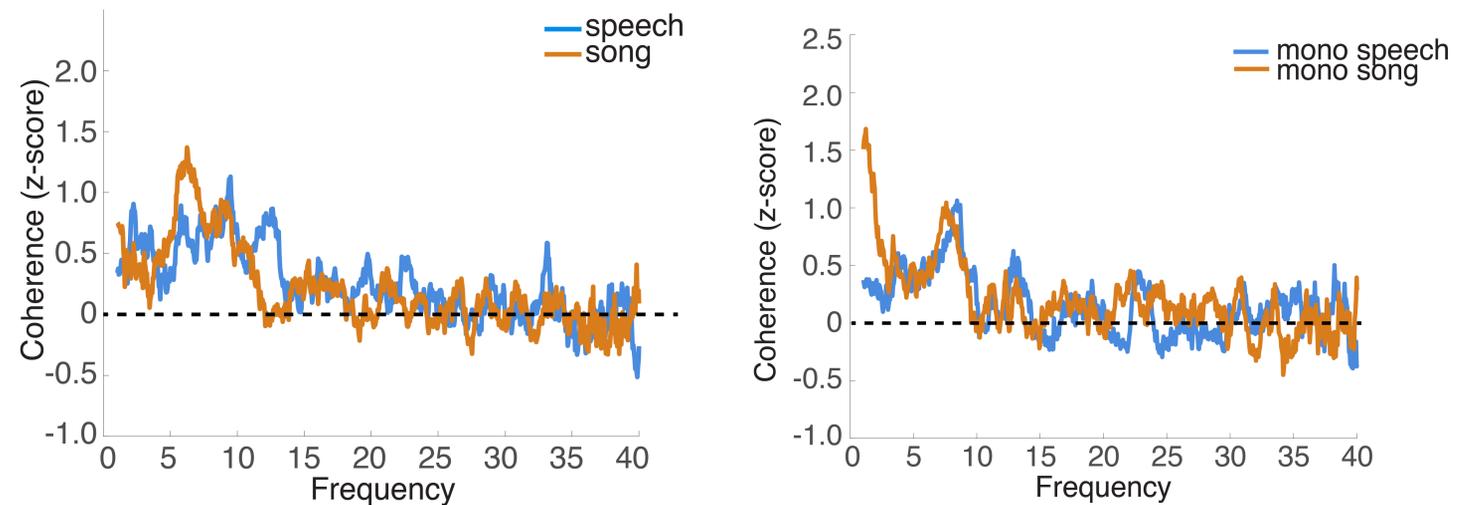
Infants watched a live silent puppet show, while sitting on their caregiver's lap and adults watched an excerpt of an animated movie without audio.

There were 88 20-second long trials and utterance types were presented in a mixed block design.

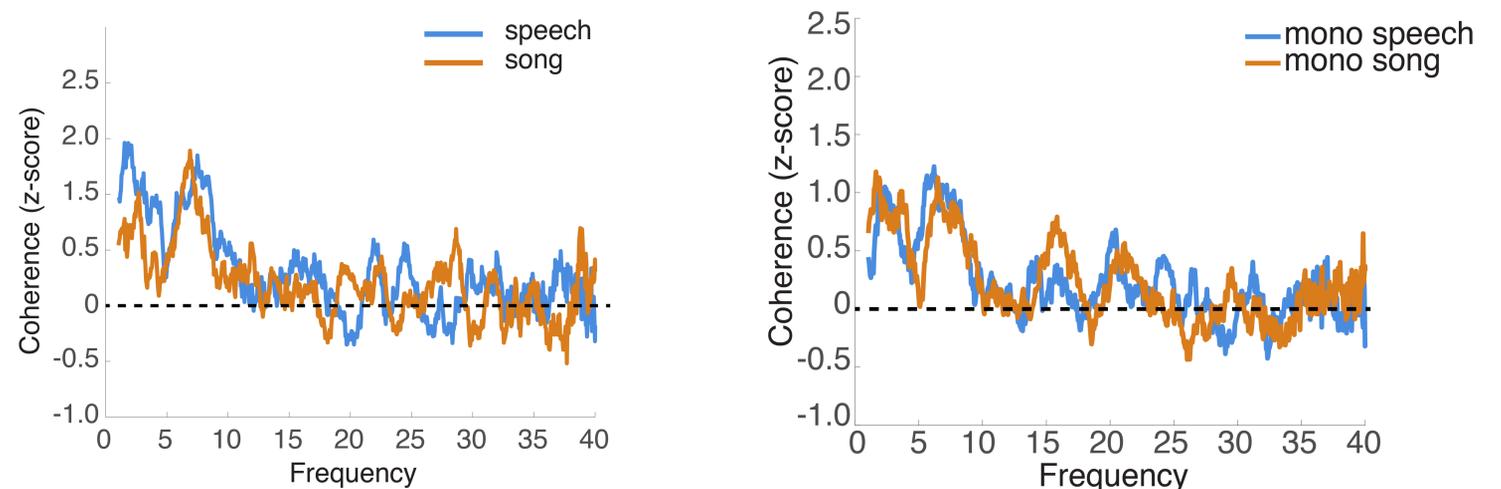
All participants were fitted with 128-lead EGI electrode nets and data was processed using FieldTrip and Artifact Blocking for artifact removal.

Results

Adults phase-lock to natural & monotone utterances



Infants phase-lock to natural & monotone utterances



There was no difference between spoken and sung utterances for either natural or monotone utterances, for either adults or infants.

Discussion

Adults phase-locked equally well to speech and song, as well as monotone speech and song

Infants showed significant phase-locking to speech and song, as well as monotone utterances.

For both groups, there were no differences between speech and song or monotone vs. natural utterances

We will correlate theta band (4-8 Hz) coherence with language outcomes at 12-months, we are in the process of collecting these language inventories.

References

Fernald (1989). *Child Dev*, 60(6), 1497-1510. Thiessen, Hill & Saffran (2005). *Infancy*, 7(1), 53-72. Schön et al., (2008). *Cognition*, 106, 975-983. Vanden Bosch der Nederlanden, Joanisse, & Grahn, 2020, *NeuroImage*.

Acknowledgments



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