

## Young children's musical enculturation: Developing a test of young children's metre processing skills

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### ABSTRACT

#### Background

Research indicates that adults can perceptually extract the beat from rhythmic sequences and can move in synchrony with that beat. At the same time, adults' ability to perceive and produce rhythmic sequences is affected by experience with the particular hierarchical metrical structure of their culture's music (Hannon & Trehub, 2005a). Evidence of specialization can be seen by 12 months of age (Hannon & Trehub, 2005b), but little is known about the developmental trajectory of this enculturation process throughout childhood.

#### Aims

We examine musical development in Western kindergarten children, asking (1) whether they show a perceptual bias for common (simple) Western meters and (2) whether perception and production abilities are correlated.

#### Method

On each trial of the perception task, five-year-olds are presented with an animal on a computer screen producing a rhythmic sequence in either a four-beat (simple), five-beat (complex), or six-beat (simple) meter, where each beat contains one of three patterns: one quarter note, two eighth notes, or one quarter rest. The sequence is then repeated by a second animal on the computer screen, who produces small alterations on half of the trials. In the metric alteration, the sequence contains one additional beat. In the rhythmic alteration, one beat is replaced by a different note pattern with the same duration. Children indicate whether the animal producing the second sequence is able to copy exactly the animal producing the first sequence. The production tasks consist of recording and analyzing the children's ability tap back simple beat sequences similar to those used in the perception task.

#### Results

On average, errors were detected at rates significantly higher than predicted by chance for all metric types by both five-year-olds ( $p < 0.001$ ) and six-year-olds ( $p < 0.001$ ). However, preliminary analyses indicate that rates of detection

of alterations were not significantly different for simple metre (four-beat and six-beat) sequences compared to the complex metre (five-beat) sequences, either for five-year-olds,  $t(44) = -0.340$ ,  $p = 0.487$ , or six-year-olds,  $t(30) = -0.463$ ,  $p = 0.324$ . Each subject's overall perception score for the simple metre condition was created by collapsing across performance on the four-beat and six-beat sequences, which both had simple metric structures composed of repeated groups of two beats. Further analyses suggest that performance on the perception task was best in the four-beat condition and worst in the six-beat condition, representing an effect of increasing sequence length. As such, average performance across the two simple-metre conditions was no different from performance on five-beat long sequences with complex metric structure. Analyses for the tapping task are ongoing.

#### Conclusions

Sequence length exerted a much stronger effect on performance on the perception task than whether the meter was simple or complex, suggesting that this task is not a sensitive measure of metric enculturation. Analyses in progress will determine whether sequence length is also the main factor affecting performance on the production task.

#### Keywords

metric processing, rhythm, enculturation, development

### REFERENCES

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