

## **Little Drummers: Infant Spontaneous Motor Tempo correlates with parental height**

Spontaneous Motor Tempo (SMT) is known to slow with age (see Provasi & Bobin-Bègue, 2003). Both tempo classification (Todd, Cousins & Lee, 2007) and preferred rate to move to (Dahl, Huron, Brod & Altenmüller, 2014) correlate with body size, with larger bodies preferring slower rhythms. Locomotion is a hypothesised factor underlying these links. We predicted that infant SMT would be faster than that of young children and would slow with age. We also predicted that tempo would correlate with anthropometric features, such that larger babies would show a slower SMT. However, we were further interested in whether SMT is linked to experience of rate of locomotion. Infants' predominant experience of locomotion may be passive, as their caregiver regularly carries them. We therefore also predicted that in infants, parental body size might better predict SMT.

We tested 170 infants ( $M=12.3$  months,  $SD=6.5$  months) in a free drumming procedure for up to five minutes. We recorded the sound wave of the infant drumming and computed offline the mean inter-onset-interval (the distance between hits) to give the SMT for each infant. We also obtained demographic and anthropometric information. We analysed data from the 115 infants who produced four or more drum hits in a continuous 'bout' of drumming.

Contrary to our hypothesis, we found that infant SMT negatively correlated with age, such that older infants were faster ( $r(114) = -.279, p=.003$ ). This can be explained by the fact that younger infants are still learning how to control their limbs to make continuous and targeted movements. Indeed, we found that older infants' SMT also had a lower relative standard deviation ( $r(114) = -.217, p=.021$ ) and that regularity

and tempo were correlated independently of age ( $r(114) = .509, p < .001$ ).

To examine relationships with anthropometrics, we rejected data with no consistent tempo, via exclusion of infants with a relative standard deviation more than one SD above the mean. This left 94 infants in the final sample. A linear regression on this sample, with infant age and parent and infant measurements entered as predictors, reveals that only infant age ( $\beta = -.459, p = .012$ ) and parental height ( $\beta = .413, p = .013$ ) significantly predict infant SMT.

We therefore find that infant SMT becomes both faster and more regular with age. Whilst tempo does not seem influenced by own body size, we see a relationship between infant SMT and parental height, such that infants with taller parents drum more slowly than infants with shorter parents. We suggest that in infants who can reliably drum, SMT may be influenced by the rhythm of caregiver gait, which they experience passively when being carried.