Supporting Information

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SI Text

Infants' Rhythmic Engagement and Their Previous Exposure to Music.
To examine the influence of prior musical experience on infants'
experimental behavior, we purposefully recruited two groups of
infants in experiment 2. One group received at least 4 months of
music education ($N = 35$), whereas the other group did not ($N = 34$). Precocious music education is popular in Finland. It typically
involves musical interactions between caretaker and infant, in
which rocking, bouncing, and clapping hands with the music play a
prominent role (1). To examine whether music education enhances infants' dancing capabilities, we conducted two analyses.

First, we computed the interaction between music education
and contrast or L-scores, which define the degree to which any
individual infant bore out the prediction. The interaction was
nonsignificant, $t(67) = 0.37$, P = not significant. Second, infants
with music education had larger synchronization errors (see
main text) compared with infants without music education [177
vs. 134 ms, $t(50) = 3.92$, $P < 0.001$, $\eta^2 = 0.29$]. The results were
similar when we correlated the duration of early childhood music
education with rhythmic engagement and coordination with
music in experiment 2. Parents also filled out a questionnaire
that captured the prominence of music listening and making in
their home environments. None of the questionnaire variables
were significantly related to the infants' rhythmic behaviors in
the experiment (e.g., approximate hours of musical exposure per
week, the amount of parental musical involvement).

1. Opetushallitus (2002) *National Curriculum in Music Education 2002* (Edita Prima, Helsinki, Finland).
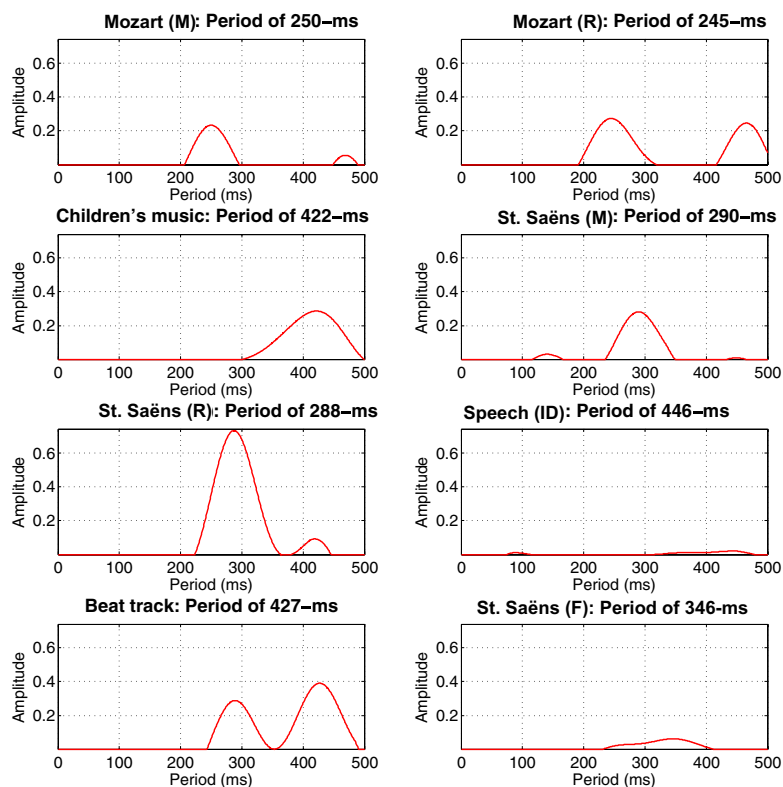

Fig. S1. Periodic structure of the stimuli displaying the main periodicities in milliseconds (*x* axis) and the clarity of the periodicity in the amplitude of the curves (*y* axis).
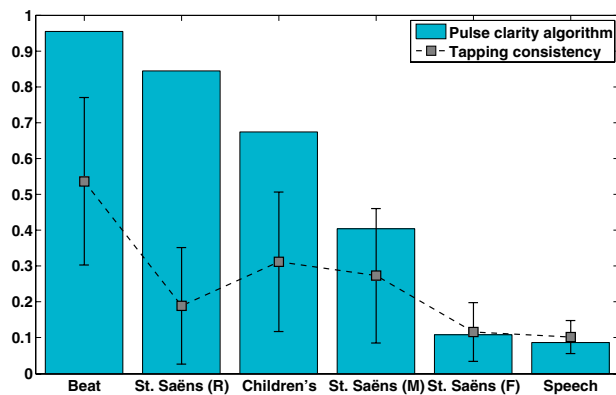
Fig. S2. Accessibility of beat in each stimulus in experiment 2 evaluated by normalized tapping consistency (lines) of a sample of 5- to 9-year-old children (means and 95% confidence intervals) and estimation of pulse clarity (bars) by a computational algorithm.

Table S1. Duration of infants' rhythmic movements by condition and age (experiment 1)

Age groups (months)	Mozart (music)	Mozart (rhythm)	Saint-Saëns (music)	Saint-Saëns (rhythm)	Adult-directed speech
5–7 (n = 14)	3.43 (1.57)	1.14 (0.66)	4.11 (1.76)	2.71 (1.74)	0.64 (0.39)
9–12 (n = 19)	7.97 (2.38)	9.84 (3.23)	9.63 (3.77)	9.47 (3.41)	2.00 (0.96)
13–16 (n = 18)	9.89 (3.49)	9.67 (3.51)	9.78 (2.64)	12.02 (3.35)	2.14 (1.08)
Total (n = 51)	7.40 (1.59)	7.39 (1.78)	8.17 (1.76)	8.52 (1.84)	1.68 (0.53)

Values are mean durations (s). SEs in parentheses.

Table S2. Duration of infants' rhythmic movements by condition and age (experiment 2)

Age groups (months)	Children's Music	Saint-Saëns (music)	Saint-Saëns (rhythm)	Infant-directed speech	Isochronous drumbeats	Saint-Saëns (fluctuating)
5–7 (n = 13)	7.47 (3.13)	6.54 (4.37)	5.64 (3.08)	5.44 (4.96)	6.52 (2.62)	10.63 (5.59)
9–12 (n = 20)	5.18 (2.11)	6.31 (2.73)	6.36 (2.15)	1.44 (0.59)	5.19 (1.80)	6.50 (2.61)
13–16 (n = 22)	6.13 (2.49)	8.05 (3.55)	4.29 (3.29)	0.60 (0.41)	6.51 (3.33)	6.85 (2.06)
18–24 (n = 14)	8.56 (4.42)	5.65 (3.49)	6.86 (3.58)	1.20 (0.91)	2.50 (1.88)	3.89 (2.43)
Total (n = 69)	6.60 (1.44)	6.77 (1.72)	5.66 (1.51)	1.87 (0.97)	5.32 (1.32)	6.86 (1.52)

Values are mean durations (s). SEs in parentheses.

Audio S1. Mozart (Music condition) from experiment 1 (excerpt). Mozart, Wolfgang Amadeus. *Eine kleine Nachtmusik*. Last movement. Recording (CD): Academy of St. Martin in the Fields. Neville Marriner, conductor. EMI Recordings (1997).

Audio S1

Audio S2. Mozart (Rhythm condition) from experiment 1 (excerpt). Created from Audio S1 by replicating the music with only percussive instruments.

Audio S2

Audio S3. Saint-Saëns (Music condition) from experiments 1 and 2 (excerpt). Saint-Saens, Camille. *Carnival of Animals*. Finale. Recording (CD): Alain Ridout et Frieder Meschwitz. Martha Argerich and Nelson Freire, piano. Philipps (1988).

Audio S3

Audio S4. Saint-Saëns (Rhythm condition) from experiments 1 and 2 (excerpt). Created from Audio S3 by replicating the music with only percussive in-struments.

Audio S4

Audio S5. Speech 1 from experiment 1 (excerpt). Children's story narrated in French (male and female voice).

Audio S5

Audio S6. Speech 2 from experiment 2 (excerpt). Infant-directed speech in English (female voice).

Audio S6

Audio S7. Children's song music from experiment 2 (excerpt). Source: Kissaminttupolkka. Recording (CD): Mukaralla, Humppeli Romppeli CD, FinalMix Oy (1997).

Audio S7

Audio S8. Isochronous drumbeat (beat 1) from experiment 2 (excerpt). 4/4 m pattern with 285-ms interonset intervals.

Audio S8

Audio S9. Isochronous drumbeats (beat 2) from experiment 2 (excerpt). 4/4 m pattern with 428-ms interonset intervals.

Audio S9

Audio S10. Fluctuating rhythmic stimulus from experiment 2 (excerpt). The original recording of Audio S3 modified with random tempo fluctuations.

Audio S10

Movie S1. A 25-s excerpt from experiment 1. Mozart rhythm, age 12 months.
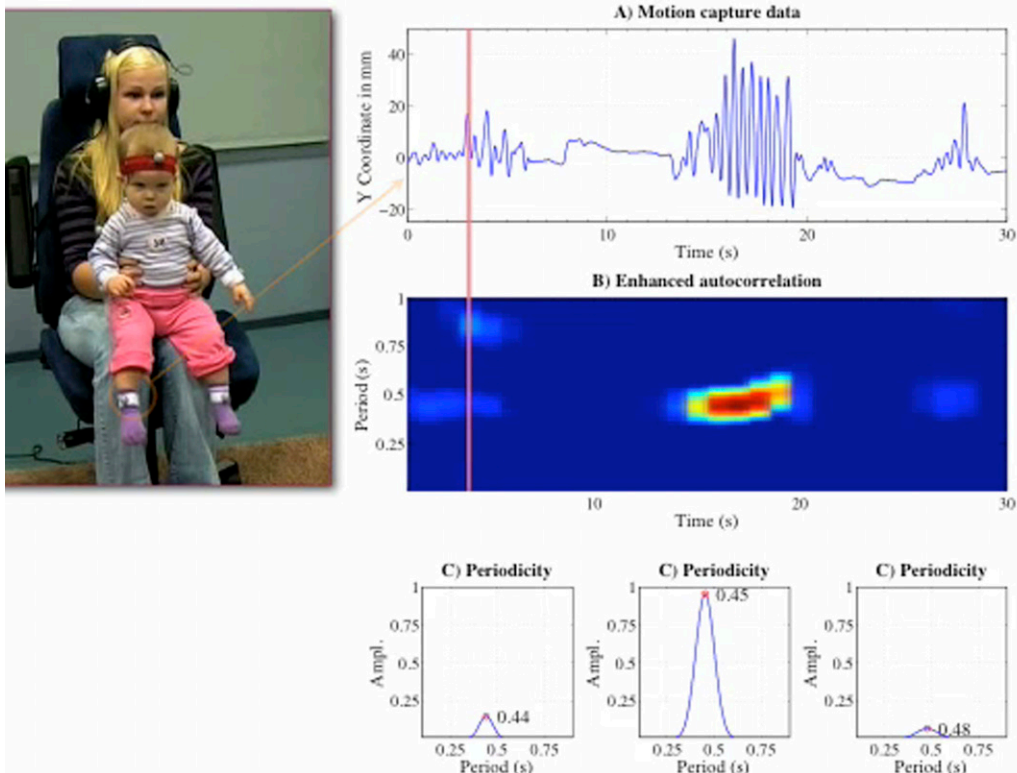
Movie S1

Movie S2. A 15-s excerpt from experiment 1. Mozart music, age 9 months.

Movie S2

Movie S3. A 50-s excerpt from experiment 2. Saint-Saëns, age 10 months.

Movie S3

Movie S4. A 35-s excerpt from experiment 1. Beat track, age 14 months, with an illustration of the motion-capture data.

[Movie S4](#)