

Newborn infants detect the beat in music

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Researchers at the Institute for Psychology of the Hungarian Academy of Sciences and the Institute for Logic, Language and Computation of the University of Amsterdam demonstrated that two to three day old babies can detect the beat in music. This phenomenon - termed 'beat induction' - is likely to have contributed to music's origin. It enables such actions as clapping, making music together and dancing to a rhythm. Beat induction is also considered to be uniquely human. Even our closest evolutionary relatives, such as the chimpanzee and bonobo, do not synchronise their behaviour to rhythmic sounds.

The findings, which have just been published in *Proceedings of the National Academy of Sciences*, challenge some earlier assumptions that beat induction is learned in the first few months of life, for example by parents rocking the infant. Instead, the results of this collaborative European study demonstrate that beat perception is either innate or learned in the womb, as the auditory system is at least partly functional as of approximately three month before birth.

It should be noted that the auditory capabilities underlying beat induction are also necessary for bootstrapping communication by sounds, allowing infants to adapt to the rhythm of the caretaker's speech and to find out when to respond to it or to interject their own vocalisation. Therefore, although these results are compatible with the notion of the genetic origin of music in humans, they do not provide the final answer in this longstanding debate.

Research method

Since it is not feasible to observe behavioural reactions in newborns, the researchers used scalp electrodes to measure electrical brain signals. The babies wore self-adhesive ear-couplers (see photo) through which a simple, regular rock rhythm was delivered, consisting of hi-hat, snare, and bass drum. Several variants of the basic rhythm were constructed by omitting strokes on non-significant positions of the rhythm (i.e. 'non-syncopated' in music theoretical terms). These variants were played to the infants, with a 'deviant' segment, missing the downbeat (i.e. 'syncopated'), occasionally interspersed. Shortly after each deviant segment began, the babies' brains produced an electrical response indicating that they had expected to hear the downbeat but had not.

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Source: University of Amsterdam

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