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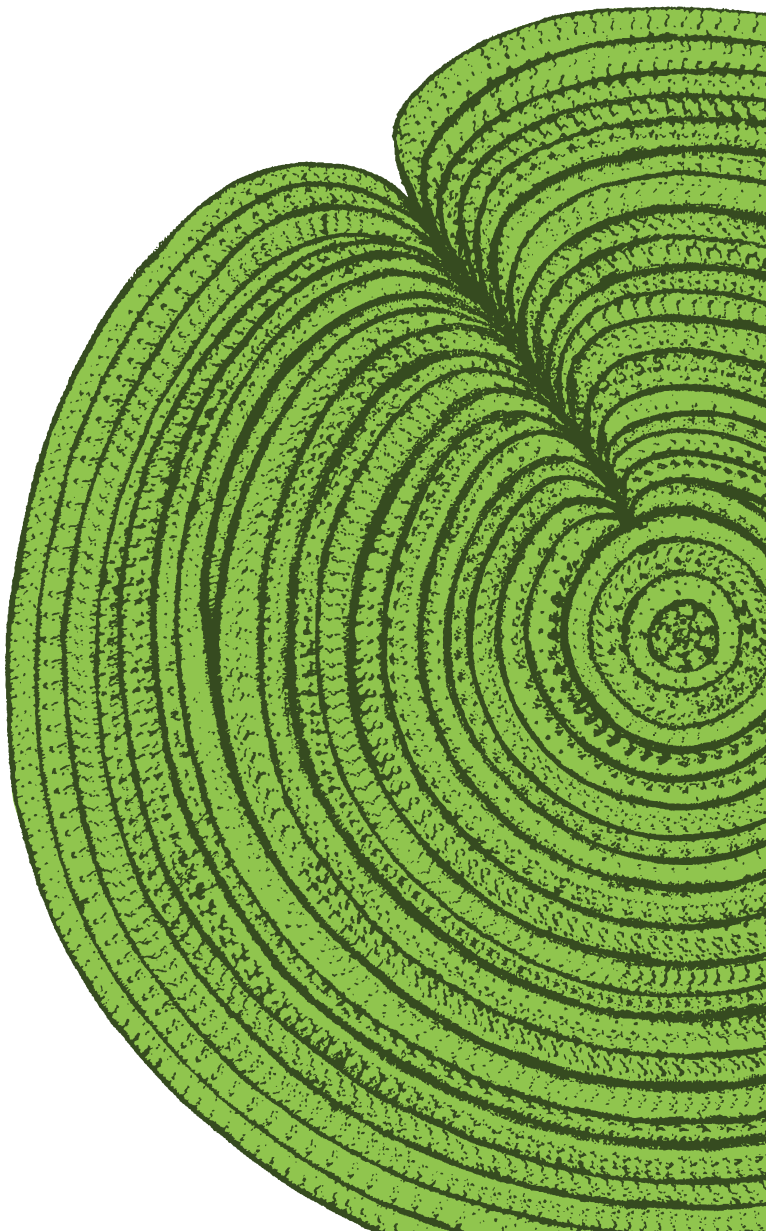

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Processing of rhythmical acoustic patterns in the domestic chicks. A behavioral exploration

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The spontaneous tendency to synchronize with a musical beat is a human universal. Recently, it has been convincingly observed also in some non-human species [1-4]. However, why synchronization ability would be present in animals is still not clear. One possibility is that synchronized behavior may have been shaped by evolution because of the predictability of rhythmic locomotion sounds [5].

In humans, organisms' locomotion is encoded either by listening to the sound of rhythmic footsteps [6], or by the visual analysis of rhythmically walking animals described by simple point-light displays [7]. Such visual point-light displays are recognized also by non-human animals as biologically-relevant stimuli [8]. Hence, raw mechanisms for visual recognition of living organisms, available at birth and shared across species [9], could be accompanied by universal acoustic building blocks of sounds of moving animals.

To address this possibility, we presented 50 chicks (Gallus gallus) with rhythmic and a-rhythmic acoustic patterns of either 120BPM or 80BPM. In a circular semi-dark environment, 4 symmetrical speakers delivered sequentially, in circular transition, the stimuli. Chicks responded to rhythmic and a-rhythmic acoustic patterns in a comparable fashion, by following the circular presentation of the 120BPM acoustic patterns but not that of 80BPM. This result is in line with chicks' spontaneous preference for normal rate of maternal clucking at about 120-130BPM [10] meaning that faster rhythmic and a-rhythmic patterns are both associated with recognition of living organism.

In a separate condition, chicks placed within the same experimental environment could listen to a continuous modulated sound. We observed a total diminution in motor activity. In the absence of pauses or accents defining an acoustic structure, chicks do not identify the presence of an organism that is worth following.

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