

## Sensorimotor Synchronization When Walking Side by Side With a Point Light Walker

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Synchronization of periodic movements like side-by-side walking [7] is frequently modeled by coupled oscillators [5] and the coupling strength is defined quantitatively [3]. In contrast, in most studies on sensorimotor synchronization (SMS), simple movements like finger taps are synchronized with simple stimuli like metronomes [4]. While the latter paradigm simplifies matters and allows for the assessment of the relative weights of sensory modalities through systematic variation of the stimuli [1], it might lack ecological validity. Conversely, using more complex movements and stimuli might complicate the specification of mechanisms underlying coupling. We merged the positive aspects of both approaches to study the contribution of auditory and visual information on synchronization during side-by-side walking. As stimuli, we used Point Light Walkers (PLWs) and auralized steps sound; both were constructed from previously captured walking individuals [2][6]. PLWs were retro-projected on a screen and matched according to gender, hip height, and velocity. The participant walked for 7.20m side by side with 1) a PLW, 2) steps sound, or 3) both displayed in temporal congruence. Instruction to participants was to synchronize with the available stimuli. The kinematics of 39 retro-reflective markers attached to the body were gathered by a motion capture system. Preliminary results indicate head and foot synchronization in all conditions, assessed by discrete relative phase. Furthermore, consistent with findings of SMS, synchronization with visual information shows higher variability. In future studies, this paradigm will be improved in order to test for sensory dominance, cue combination, and weighting strategies.

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