Adding dance to the sound of music: The role of embodiment in audiovisual rhythmic stimulation

Yi-Huang Su[1]

[1] Department of Movement Science, Technical University of Munich, Munich, Germany
yihuang.su@tum.de

Abstract. Musical rhythms consist of metrical temporal patterns, which are frequently adopted as auditory cues to guide motor behaviors, e.g., people easily move in a regular and synchronized manner to a musical beat. The benefit of auditory stimulation is believed to originate from its effective coupling with the motor system both internally and externally. My research explores how this mechanism may be modulated, or even strengthened, by adding ecologically compatible visual information to yield multisensory rhythmic cues. Dance provides a suitable visual rhythm for this purpose, as dance observation leads to internal simulation of movement patterns, or embodiment, that may be shared by musical rhythms. I will show that, when observing point-light dance movements and listening to musical rhythms in parallel, participants could distinguish whether the auditory and visual rhythms matched in terms of meter (i.e., how events are grouped based on accentuation). Furthermore, the visual meter of dance biased auditory metrical interpretation, and metrical congruency between auditory and visual rhythms also modulated the strength of cross-modal temporal binding. Finally, in support of the embodiment hypothesis, the effect of visual rhythm was modulated by agency, namely, whether the dance movement was one's own or of another person. Together these results point to the potential of combining rhythmic auditory and visual cues in which the latter is composed of motion connected to the former. Moreover, the kinematic compatibility of visual motion cues for each individual may be worth considering when designing optimal audiovisual rhythms.

Keywords: rhythm, music, dance, audiovisual, embodiment, agency