Body Schema Projection in Musicians and Non-Musicians; The Role of Coordination Mechanisms in Updating Functional Body Representations

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Abstract: How are body representations updated when we perform joint rhythmic actions, such as when a jazz player synchronizes with other musicians in the ensemble? We investigated this question using a continuous tapping task where musicians and non-musicians were instructed to imitate bimanual hand movements presented in the egocentric and the mirror orientation. The observed movements increased in tempo (from 3.5 Hz to 4.2 Hz). Results showed that participants were more accurate in imitating the timing and spatial parameters of observed movements in the egocentric than the mirror orientation. However, the pattern of performance in the mirror orientation varied depending on rhythmic ability: Musicians mapped the observed movements anatomically (e.g., left-hand was aligned with the observed left-hand) and non-musicians aligned their responses spatially to the stimuli (e.g., left-hand was aligned with the observed right-hand). These results suggest that temporal coordination mechanisms play an important role in updating of the body schema.