

Skilled performers show right parietal lateralization during anticipation of beach volleyball attacks

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Abstract

The way in which biological motion is processed, globally or locally, may depend upon the observer's perceptual skill or experience with the stimulus. Skilled athletes with extensive perceptual experience observing sport-specific movements use globally distributed motion information across an opponent's body to anticipate actions, while less skilled athletes focus on single-reliable kinematic cues. Published reports have demonstrated that attention can be primed globally or locally before perceptual tasks, and such an intervention could highlight motion processing mechanisms used by skilled and less skilled observers. In this study, we investigate skill-differences in biological motion processing using attentional priming. Skilled (N = 16) and less skilled (N = 16) players anticipated temporally occluded videos of beach volleyball attacks while being primed using a Navon matching task. EEG at parietal regions was measured to index global or local attention. Skilled players were more accurate than less skilled players across occlusion intervals and priming conditions. Global priming resulted in better performance for both skill groups. Skilled players showed significantly reduced alpha and beta power in the right compared to left parietal region, but brain activity was not affected by priming interventions. Our findings highlight the importance of right parietal dominance for skilled performers, which may be functional for inhibiting left hemispheric local processing or enhancing visual spatial attention for dynamic visual scenes. Further work is needed to systematically determine the function of this pattern of brain activity during skilled anticipation in other contexts.

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