

Local Biological Motion Cues Trigger Reflexive Attentional Orienting in the Brain

Walking is arguably the most frequent movement in bipeds (e.g., humans) and quadrupeds. Walking direction conveys the disposition and intention of a biological entity, to which humans are highly sensitive since birth. Aside from global configuration, local motion itself has been found to play a critical role in biological motion perception, suggesting a specialized brain mechanism that acts as a “life motion detector” for processing local biological motion information. However, its functional role remains to be delineated. In what way does such intrinsic sensitivity to local biological motion signals affect human behavior?

Dr. JIANG YI's research team probes this issue with a modified central cueing paradigm that specifically examines the attentional orienting effect in response to the feet motion cues. It was found that observers involuntarily directed their attention to the walking directions of upright, but not inverted, feet motion signals, which was accompanied by an early (100-160 ms after stimulus onset) attentional lateralization in the event-related potentials recorded from occipitoparietal regions, independent of whether the observers were aware of the biological nature of the motions. In other words, local biological motion alone automatically induced robust attentional orienting that manifested itself in both neuronal activities and behavioral responses. These findings unambiguously demonstrate the automatic processing of local biological motion without explicit recognition. More importantly, with the discovery that local biological motion signals modulate attention, we highlight the functional importance of such processing in the brain.

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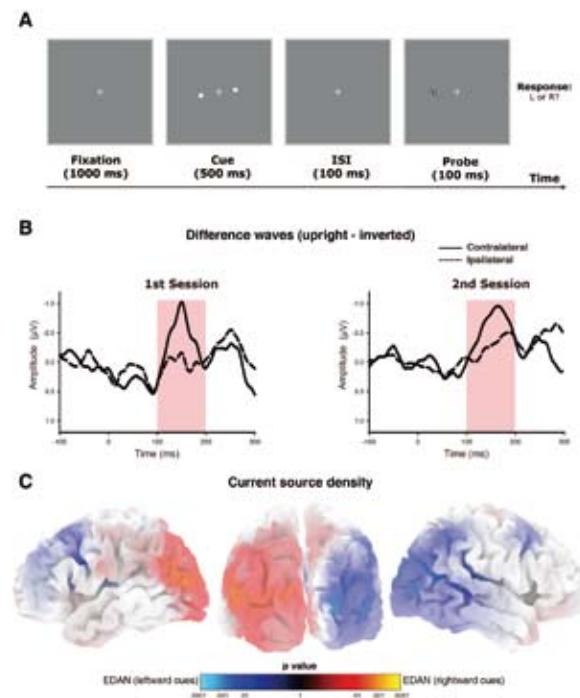


Figure: (a) Schematic representation of the experimental paradigm; (b) Difference waves; and (c) Current source density related to the EDAN effect. (Image by JIANG Yi)