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Motor Development Supports the Emergence of Visual Body Representation in Infants

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The ability to distinguish one's own body from the external world is a crucial milestone in early development. Hands may play a crucial role in this process: from the earliest spontaneous movements, as infants engage in visually guided actions, the integration of visual, proprioceptive, and motor information may strengthen their ability to discriminate their own hands from the environment. In this study, we examined when infants begin to represent hands as a distinct perceptual category from objects, and whether this ability is influenced by motor development. Using an EEG frequency-tagging visual paradigm, we measured infants'brain responses while they viewed sequences of object images, with hands embedded at a fixed periodic rate. We tested two age groups: 3–4 months (before grasping typically emerges) and 6–7 months (after grasping onset). Furthermore, motor skills were assessed using the Peabody Developmental Motor Scales. A significant neural response at the hand presentation frequency was observed only in the 6–7-month-old group, suggesting that hand-object visual discrimination emerges after grasping onset. Importantly, the greater the amplitude of the visual discrimination response of the hand, the higher the scores on the subscale assessing fine movements of the hand (but not gross movements of other body parts). This indicates that sensorimotor experience, especially involving hand motor control, may support the development of abstract body representations, also promoting a foundational step toward the emergence of bodily self-awareness early in life.

If you're submitting a symposium talk, what's the symposium title?

The Body Across the Lifespan: How Body Representation Is Shaped from Infancy to Old Age

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

Yes

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