

Brain Signatures of Communication (BraiSiCo) project

Neural correlates of basic gestures in communication

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Language acquisition research has shown early gestural communication emerging already in the first year of life, which may form an important basis of later human communication using spoken constructions (Bates, 1976). Children's early communicative repertoire consists of two types of gestures - the *Pointing* gesture for directing attention to an object and the *Give-me* gesture for requesting a desired object (Bates et al., 1975; Tomasello, 2003). As caregivers react to these gestures by looking at or handing over relevant objects, these gestures are gradually conventionalized as tools of communication, thus serving as 'proto-speech acts' of Naming and Requesting (Kelly, 2006). Despite the fundamental role played by gesture in social interactions, and for the development of language abilities (Bates, 2014; GoldinMeadow et al., 2007), relatively little is known about the brain signatures of these pre-linguistic gestural acts in social-communicative interactions. To close this gap, we investigated the neural correlates of two basic hand-gestures, Pointing and Give-me, indexing the illocutionary communicative roles of Naming and Requesting. As a control condition, physically matched unrecognisable Blurred gesture picture stimuli were created, which did not indicate any speech act. Perceiving Give-me and Pointing gestures elicited an early and robust positive-going event-related response within ~ 210 ms, whereas the control condition did not. Furthermore, the 'P210' response was significantly larger for the Give-me gesture expressing request compared with the Pointing gesture expressing naming, which might reflect the richer action knowledge implicated by directive communicative acts. The current data are the first to show that pragmatic information of basic gestures, applied early in ontogeny by the infant to communicate different intentions, are processed very fast and functionally dissociate in the adult human brain.

Reference:

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