

Embodied and Situated Cognition: from Phenomenology to Neuroscience and Artificial Intelligence

SOCIAL COGNITION AND SOCIAL ROBOTS

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The theoretical underpinnings of social cognition have been shifting away from overly-intellectualistic conceptions based on theory of mind approaches, toward more embodied versions of simulation and interaction theories. In theory of mind approaches social cognition is framed in terms of gaining access to the other person's mind; in simulation theory (especially implicit versions) the activation of neural resonance systems (mirror neurons, shared neural representations) puts conspecifics into the same or similar sensory-motor states, and this is the basis for social understanding that is informed by action schemas or emotion based empathy (e.g., Decety 2004, 2005; Gallese 2003). Interaction theory appeals to the same neuroscience of resonance systems, and builds on research in developmental psychology, to show that the basis of social cognition is both perceptual and contextual (Gallagher 2001, 2004, 2005).

Here I want to explore some questions about human-robot interaction. What are the specific elements that robots and intelligent agents need to manifest in second-person interactions with humans to facilitate human understanding of the robot? How dependent on, or independent of human embodiment are these elements, and is it nonetheless possible to create homologous substitutes in robotic bodies for those elements that are highly dependent? What kinds of methods can we use to answer these questions?