

Sense of Self: The Importance of Sensing your Motions in the World

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Embodied cognition and the sense of self

Within recent materialist philosophy and cognitive science, the focus in relation to the problem of the self has been almost exclusively on the brain. We submit that the resulting negligence of the body and of bodily motions in the world has been detrimental in understanding how organisms develop a sense of self. We examine the importance of sensing one's own motions for the development of a basic, non-conceptual sense of self. More specifically, following Sheets-Johnstone (1999), we argue that the origin of the sense of self stems from the sensitivity to spontaneous movements. Based on this, the organism develops a sense of 'I move' and, finally, a sense of 'I can move'. Proprioception and kinesthesia are essential in this development.

At the same time, we argue against the traditional dichotomy between the so-called external and internal senses, agreeing with Gibson (1979) that perception of the self and of the environment invariably go together. We suggest that the pre-linguistic body sense is of great importance to development of our sense of self.

The theory of embodied embedded cognition provides the first cornerstone of our research. From this perspective, the bodily interaction with the environment is perceived as *constitutive* of our sense of self and of more developed forms of cognition. These do not reduce to mere consequences of brain processes. Embodiment refers to the specific influence that bodily characteristics have, not only on cognition, but on our very basic perceptual processes. Because our bodies have certain features (e.g. our heads cannot turn 360 degrees, our knees bend only in one direction), certain behaviors are more 'natural' than others. In the course of development, our sense of self become thoroughly intertwined with the specific potential for behavior that our bodies afford.

The notion of embeddedness emphasizes the possibilities for *interaction* with the environment; every situation facilitates certain actions and impedes others. In this context, we attempt to draw some consequences for research in cognitive science, specifically in the area of robotics (Brooks, 1992, 1999; Nolfi, 1998; Nolfi & Floreano, 2000; Ziemke, 2003), by examining a case of missing proprioception. We

make a plea for robots to be equipped not just with external perceptual and motor abilities but also with a sense of proprioception. This, we submit, would constitute one further step towards understanding creatures acting in the world with a sense of themselves.

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