Embodied Cognition and Neuroethology: A Defense of Information Processing Models

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Abstract

Certain strains of the research programs known as "embodied cognition" have advocated the elimination of representational or information-processing models in explanations of cognition. Radical embodied cognition theorists stress the role in which the environment and the organism's bodily form structure and govern behavior, especially perception and action with minimal reference to "internal" information-processing mechanisms. However, as I will argue, the experimental methodology known as "neuroethology" provides an example of how close attention to just these sorts of bodily and environmental factors provides reasons to postulate information-processing mechanisms, as well as an experimental apparatus for discovering their functional organization. This suggests that cognitive neuroscience can take on the insights of embodied cognition's theoretical emphases while not jettisoning what is likely an important concept for explaining complex environmental navigation – neural information-processing. After some analysis of the particular aspects of the experimental and explanatory methodology of neuroethology, I will present some recent work by Paul Williams and Randall Beer in information theory which I think suggests a method for thinking about the kind of information-processing that occurs in embodied nervous systems. By combining these two pictures, I will show that rather than give us pause about representational theorizing – when combined with this fresh information-theoretic perspective – neuroethology's attention to the crucial role played by body and environment provides empirical resources for better understanding the nature of neural information processing, the explanatory utility of representational models, and sheds light on the kind cognitive systems which warrant this kind of explanation.

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