

Embodied Cognition: A field guide

Summary

This paper by Michael L. Anderson discusses embodied cognition, its definition, research, and argues that this new way of looking at cognition is formulated on the understanding that in order to truly have a sense of cognitive abilities you must have a body to be able to formulate and respond to the environments around you.

Knowledge Relating to the Cognitive Science Program Learning Outcomes

1.) Language and Culture

Language and linguistically available concepts are highly abstract phenomena; one would therefore expect the criteria for participation in a linguistic community to be likewise somewhat abstract. Thus, the concept of 'walking', in so far as it is logically and semantically related to various concepts of movement, and given that examples of walking exist in, and can be easily seen in the environment, ought to be easily acquirable by an individual who cannot, and who perhaps never could, walk.

2.) Symbol Systems

Simply put, cognitivism is the hypothesis that the central functions of mind—of thinking—can be accounted for in terms of the manipulation of symbols according to explicit rules. Cognitivism has, in turn, three elements of note: representation, formalism, and rule-based transformation. First and foremost is the idea that cognition centrally involves representation; cognitivism is committed to the existence of “distinct, identifiable, inner states or processes”—that is, the symbols—“whose systemic or functional role is to stand in for specific features or states of affairs” [20, p. 43]. However, just as is the case in modern logic, it is the form of the symbol (or the proposition of which the symbol is a part) and not its meaning that is the basis of its rule-based transformation.

3.) According to Lakoff and Johnson, the mind is inherently embodied not just because all its processes must be neurally instantiated, but also because the particulars of our perceptual and motor systems play a foundational role in concept definition and in rational inference. Color concepts, for instance, are characterized by a “center-periphery” structure, with certain colors being “focal” and others conceptualized in terms of the focal hue. In the category “red” there is a central red, as well as peripheral hues tending toward the purple, pink, and orange. “The center-periphery structure ... is a result of the neural response curves for color in our brains. Focal hues correspond to frequencies of maximal neural response”, with

the peripheral structure being determined by the overall shape of the neural response curve.

4.) Darwinian Processes and Phenomena

Reason is evolutionary, in that abstract reason builds on and makes use of forms of perceptual and motor inference present in “lower” animals. The result is a Darwinism of reason, a rational Darwinism: Reason, even in its most abstract form, makes use of, rather than transcends, our animal nature. The discovery that reason is evolutionary utterly changes our relation to other animals and changes our conception of human beings as uniquely rational. Reason is thus not an essence that separates us from other animals; rather, it places us on a continuum with them.

5.) Embodiment, Emergence, and Distributed Cognition

Instead of emphasizing formal operations on abstract symbols, this new approach focuses attention on the fact that most real-world thinking occurs in very particular (and often very complex) environments, is employed for very practical ends, and exploits the possibility of interaction with and manipulation of external props. It thereby foregrounds the fact that cognition is a highly embodied or situated activity—emphasis intentionally on all three—and suggests that thinking beings ought therefore to be considered first and foremost as acting beings.