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Emergence: A Proposal for a Foundational Revolution in Cognitive Science

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Abstract

Emergence has been a fundamental part of physics, chemistry, and biology since the turn of the century. The sub-disciplines of cognitive science have all adopted emergentist approaches in many areas within their field, yet cognitive science as a whole lacks an overarching theory between the sub-disciplines. Therefore, I propose that emergence is a valuable conceptual tool for unifying the sub-disciplines of cognitive science, as it will facilitate communication via a shared emergentist framework. Although there are several definitions of emergence, cognitive science can benefit from an overarching view that regardless of discipline, reductionistic approaches are unable to describe cognition from the macro to the micro without invoking emergent stages of explanation. The reluctance to adopt an emergent paradigm surrounds the issue that emergent phenomena cannot be predicted from their component parts, which challenges the way experiments in cognitive science are designed and conducted, and how cognition is modeled computationally.