

Public Abstract

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Title:Exploring the Structure of Cognitive Processes: Discrete and Continuous Theories of Memory and Perception

Scientists have studied the structure of human cognition and its many specialized processes and systems for years. One domain of particular interest is recognition memory. Although research findings have been expansive, a debate still exists over the structure of the recognition process. Is recognition better characterized as discrete or continuous? Supporters of continuous theories suggest that cognitive phenomena like memories have finely graded perceptual strengths that people have access to and can use to make decisions during recall. Discrete theories, in contrast, are characterized by discrete mental states which drive recall decisions. The probability a certain event is recognized depends only on which state one is in. Most researchers do not consider that cognitive processes might be discrete because of a particular pattern in the behavioral literature. The author shows these patterns rule out only a very constrained discrete-state model and not discrete-state models in general, which in turn motivated the research in this thesis.

The author conducted two experiments, each consisting of two tasks, in an attempt to resolve the debate over continuous and discrete processing. Experiment 1 tested discrete-state assumptions for two-alternative forced choice recognition memory and word identification tasks. Experiment 2 extended the word identification paradigm to both two-choice and one-choice designs. Results from both experiments consistently favored a discrete-state model over a comparable latent-strength model. Most modern recognition memory and visual perception researchers lean largely in favor of continuous or dual-process models, but this evidence for discrete states suggests the debate is far from over.