

# Center for Cognitive Science

University at Buffalo, State University of New York

## Spring 2001 Colloquia

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**Wednesday, February 21 2001**

2:00 pm - 3:30 pm  
280 Park Hall, North Campus

### Journey to the Center of the Category

Knowlton and Squire showed that amnesics perform relatively normally when categorizing dot patterns derived from an underlying prototype. But they are impaired in performing an old/new recognition task with similar materials. Knowlton and Squire concluded that categorization performance relies on an implicit memory system--intact in amnesics--that represents category-level information in the form of prototypes. They concluded that recognition performance relies on an explicit memory system--impaired in amnesia--that contains declarative memories about specific exemplars. This dissociation in amnesia between categorization and recognition seems to challenge a unitary exemplar theory that assumes a single exemplar-based processing system. Responding to this challenge, Nosofsky and Zaki (1998) derived new formal models of categorization and recognition that were intended to explain the amnesia data using only exemplar-based processing.

Our theoretical analysis of Knowlton and Squire's data, and of Nosofsky and Zaki's reinterpretation of them, suggests these conclusions. 1) Comparing to-be-categorized items to a category center or prototype produces strong prototype advantages and steep typicality gradients, whereas comparing to-be-categorized items to the training exemplars that surround the prototype produces weak prototype advantages and flat typicality gradients. 2) Participants (including amnesics) show the former pattern, suggesting their use of prototypes. 3) Exemplar models account poorly for these categorization data, but prototype models account well for them. 4) The recognition data suggest that controls use an exemplar-memorization process more powerfully than amnesics. By pairing categorization based in prototypes with recognition based in memorized exemplars, we support the idea of multiple systems or processes underlying categorization and recognition, we extend other recent accounts of cognitive performance that intermix prototypes and exemplars, and we reinforce traditional interpretations of the categorization-recognition dissociation in amnesia.

**Refreshments will be available, everybody is welcome.**

**For information please call the Center for Cognitive Science at (716) 645-3794  
or check: <http://www.cogsci.buffalo.edu>**