

Dedre Gentner, Ph.D.

DEPARTMENT OF PSYCHOLOGY, COGNITIVE SCIENCE PROGRAM
DEPARTMENT OF EDUCATION AND SOCIAL POLICY
NORTHWESTERN UNIVERSITY

"Why we're so smart"

Thursday,
April 28, 2005

3:30pm - 5:00pm
Baird Concert Hall
North Campus

Open to the Public
Free Admission

Human cognitive abilities are remarkable, and even more remarkable is the rapidity with which children develop cognitive insight. How does this insight arise? A pervasive view in cognitive development is that these rapid gains can only be explained by assuming that infants begin with substantial amounts of innate knowledge. In this talk I propose an alternative approach, centered on mechanisms of human learning. I suggest two powerful forces that contribute to human learning and reasoning ability: (1) analogical processing; and (2) the acquisition of relational language. I will present evidence that the structure-mapping processes that occur during analogy and similarity are a core mechanism by which abstract knowledge arises from experience. Our studies of learning in adults and children show that analogical comparison processes foster learning in several ways: by aligning common relational structure, by suggesting inferences between situations, by focusing attention on relevant differences, and by inviting relational abstractions.

A further contributor to human learning and reasoning is the acquisition of relational language. Relational language provides labels that preserve and systematize the relations discovered through comparison processes. It also acts to invite analogical comparisons that reveal common structure. In sum, I suggest that mutual bootstrapping between structure-mapping processes and relational language is a major contributor to human cognition.

About Dedre Gentner:

Dedre Gentner's research is on the psychology of learning and reasoning and the development of cognition and language. Her early work on causal mental models and on the development of word meaning have been influential in cognitive research. Her most important contribution is the structure-mapping theory of analogy and similarity and its implications, including a computational model of similarity processing; a theoretical framework for analogy and metaphor; the evidence for disassociation between the kind of similarity that governs memory retrieval and the kind of similarity that governs on-line mapping and inference. In her developmental work she has proposed a relational shift in children's similarity processing and has found evidence that this shift is knowledge-driven, rather than maturational. She has also pro-

posed and tested a progressive alignment mechanism whereby comparison processes in ordinary experience can yield theoretical insight.

In language learning, Gentner's hypothesis of a language-universal advantage for nouns in children's early word learning that has engendered considerable research. Her recent work unites analogical thinking and language learning and investigates possible interactions between language and cognition. Her theoretical and empirical work provides evidence that relational language has a formative role in the development of relational thought. She is also investigating the hypothesis that analogical processes are integral to language acquisition and use.