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Self-Explanation in Concept Learning

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This abstract reports about a preliminary research relating self-explanation to theory-based categorization. Main question and method are outlined.

Self-explanation is the process of generating an explanation for oneself in the course of learning activities. Many studies showed that this process is associated with problem-solving successes (Chi et al., 1989, 1994; Pirolli and Recker, 1994). These studies considered varied kinds of learning material: worked-out example, expository text. We want to know if similar results would occur within the context of classical concept learning.

This question is put in light with the studies of Wisniewski and Medin (1994) about the interaction of theory and data in concept learning. Since people's intuitive theories have been shown to determine the kind of rules they produce to define a concept and, on the other hand, self-explanation is thought to work by relating material to be studied with pre-existing theory (VanLehn, Jones and Chi, 1992; VanLehn and Jones, 1993), it seems, that in examining the impact of self-explanation in concept learning we could learn more about the constructive process of conceptual category. Moreover, the type of concept learning task using natural-like concept like *drawing made by a creative child* as proposed by Wisniewski and Medin (1994) is more similar to many real-life learning situations than is artificial concept learning and we would benefit to know if the self-explanation effect can be reproduce in those learning situations.

Hypothesis

Wisniewski and Medin (1994) results establish that when subjects can activate intuitive theories in the context of concept learning, they tend to use principles and hypothesis to make sense of the characteristics of the data. Consequently, their rules are loaded with abstract features and can be described as hierarchical since they include abstract properties defined by other properties that are themselves abstract or concrete. As the self-explanation process is thought to amplify the instanciation of intuitive theories, we should observe an augmentation of rules embedding abstract features when induced to self-explanation subjects engage in concept learning task. Our main question is then : does eliciting self-explanation in the context of concept learning within a significant domain modify rules and properties produced? We compare specialization rules that construct target categories by adding properties to a pre-existing conceptual category and descriptive rules that construct target categories by listing properties associated to. Eliciting self-explanation steer subjects to search for relations between the data and their prior knowledge, consequently they produce more abstract properties, the presence of a significant context enable them to anchor the constructive process in an already made conceptual category producing a specialization rule.

Two hypothesis are considered: H1 : Eliciting self-explanation in the context of concept learning augments rules based on abstract properties. H2 : Eliciting self-explanation in the context of concept learning within a significant domain augments specialization rules.

Method

This study compares performances of subjects exposed to four experimental conditions in a non-incremental rule-learning task in which they produce a classification rule by examining categories of items. Subjects are randomly assigned to a condition where they will be exposed to elicitation to self-explanation or not and where they will have a significant domain for the concept formation task or not in a 2 x 2 factorial design.

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