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Schematic Drawings of Abstract Concepts: Testing the Feasibility of Perception-Based Schematic Representations

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Introduction

An important aspect of cognitive science is the study of how people represent knowledge. A more specific question concerns the representation of abstract concepts (e.g. *preference*). Recently, it has been demonstrated that concrete as well as abstract verbs activate a spatial representation in the form of an oriented line (e.g. Richardson et al., 2003). Richardson et al. (2001) found that there is substantial agreement among participants for such drawings, even for abstract verbs. This suggests that abstract knowledge may in principle be represented by spatial or perceptual experiences. We were interested whether schematic drawings could also be observed for abstract noun concepts (such as *prejudice*). We expected the drawings for abstract noun concepts to be quite schematic, with higher schematicity for more abstract nouns.

Method

Sixty Northern Illinois University undergraduates participated for course credit. Each participant was asked to make simple drawings for 24 abstract nouns (8 of high, 8 of medium and 8 of low abstractness level). They were told that the drawing should describe the essence of the word, and that they could not use any numbers, words or punctuation marks. In contrast to related studies (e.g. Richardson et al., 2001), participants did not see an example drawing (or components). Thus, the task was relatively unconstrained to allow for variation. Should agreement be found across participants, this should constitute relatively strong support for the possibility of spatial schematic representations.

Materials were 48 abstract nouns at 3 different abstractness levels, with high familiarity and drawn from 8 different abstract concept categories. Participants had the opportunity to highlight what they considered the most important part(s) of their drawings and to add comments after completing the task.

Results & Discussion

Drawings were coded as schematic only if they contained no elements that were recognizable as a specific

entity (such as a person), and as specific otherwise. Overall, 16% of drawings were schematic, 73% were specific, and 11% were blank. The proportion of schematic drawings decreased marginally with concreteness, $r=-.26$, whereas the proportion of specific drawings increased, $r=0.34$, $p<0.05$. Selected items (e.g., *infinity*) evoked high proportions of schematic drawings (around 50%).

The proportion of participants who produced similar drawings was slightly higher for schematic (52%) than for specific drawings (49%). This suggests that the schemata capture an essential aspect of the items, whereas the specific drawings may also have included associations and specific examples which tend to vary more. Agreement was highest among schematic drawings for the least abstract items (58%), such as *equality* or *problem*. Agreement dropped off to about 46% for more abstract items. Overall, it seems that for most items some common schema could be accessed. Of particular interest were parallels between specific drawings and schematic drawings for the same word, which occurred particularly for abstract relations (e.g., *difference*, *exception*). Thus, schematic representations may most likely underlie particular categories of abstract items. Overall the results merit further investigations of schematic representation of abstract nouns.

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