

# The Automaticity of Image Schema Function in Metaphor Comprehension

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## Introduction

The purpose of this study was to provide experimental evidence for orientational metaphors on the basis of the VERTICAL image schema (e.g., Lakoff & Johnson, 1980). One of the hypotheses implied by the conceptual metaphor view assumes that metaphorical thought functions automatically in people's online understanding of linguistic meaning. If this is correct, we should always access the image schema whenever we understand the meaning of a word that is believed structured by orientational metaphor.

To test the hypothesis, the Stroop-like spatial judgment task was employed (Nakamoto, 2000). In the task, the directionality on the VERTICAL schema of target words was introduced as the irrelevant dimension to the spatial judgment. If the target words, expressed using verticality-related words, are understood through the image schema, then directionality on the schema should affect judgment.

## Method

**Task and procedure.** Participants were required to judge the spatial location of the target words. Each stimulus consisted of a square with a target word either directly above or below (Figure 1). At the center of the square, the word "above" or "below" was printed. The target words were conventionally expressed using verticality-related words (MORE-LESS, WARM-COLD, GOOD-BAD; the pair XXX-XXX for the control and the pair HIGH-LOW, literally related to verticality, also served as targets).

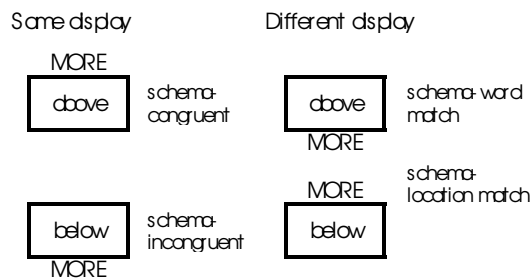


Fig1 Examples of the stimuli

Participants were instructed to judge whether the location of the target word matched the word "above" or "below" in the square. If it matched, they were required to respond "same", or "different" if it did not. In the task, the dimensions relevant to the judgment were the word in the square and the target location, while the meaning of the target word was irrelevant. A sentence that included the target word (e.g., "His income is more") was presented before the spatial judgment display, to encourage participants to interpret the

target word literally. (In the experiment, all of the words in the stimuli and the preceding sentences were in Japanese.)

**Relevancy factor.** Relevancy was defined by the combination of the dimensions that were relevant to judgment with the irrelevant dimension. For 'same' displays, two levels of relevancy, schema-congruent (the directionality of the target word was congruent to its location and the word in the square) and schema-incongruent (the directionality was incongruent to both), were defined. For 'different' displays, schema-location match (the directionality of the target matched its location) and schema-word match (it matched the word in the square) were defined (see Fig.1).

**Participants.** Thirty-two Waseda University students served as voluntary participants. All were native speakers of Japanese.

## Results and Discussion

Mean response times for 'same' judgments are shown in Fig. 2. As shown, participants judged the spatial location of the target faster when it was presented above the referent square than when it was presented below the square. The figure also shows that judgment required a longer time in the schema-incongruent form than it did in the schema-congruent form, and that the interaction between relevancy and target-pair was also significant. These results suggest that certain concepts that are usually expressed with verticality-related words automatically activate the image schema. However, the significant interaction suggests that the strength of the association with the schema differs among concepts.

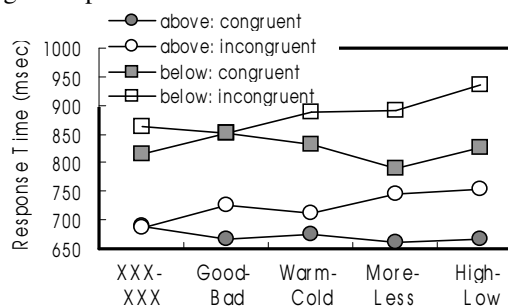


Fig2 Mean response times for same judgment

## References

- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: The University of Chicago.
- Nakamoto, K. (2000). Is more really up? Experimental evidence for orientational metaphor. *Japanese Journal of Psychology*, 71, 408-414 (in Japanese).