

# Evidence for Metaphoric Representation: Perspective in Space and Time

Lera Boroditsky

Psychology, Bldg 420

Stanford University

Stanford, CA 94305

lera@psych.stanford.edu

## Introduction

Lakoff & Johnson (1980) claimed that abstract domains are understood as metaphors from more concrete experiential domains. One particular claim is that people understand statements about time as spatial metaphors. This exciting claim deserves empirical investigation.

In English, two different spatial metaphors are used to talk about time: the *ego-moving* and the *time-moving* metaphors (Clark, 1973). In the ego-moving metaphor, time is a stationary path along which we travel from the past to the future (e.g. "We are coming up on the exam"). In the time-moving metaphor, we are a stationary observer, and time is a stream that moves past us from the future to the past (e.g. "The exam is coming up").

In the present study I identify the spatial analogs of the ego-moving and time-moving perspectives. I then ask whether the cognitive tasks of sequencing events in time and ordering objects in space are indeed accomplished by using the same relational schemas. If the same schemas are referenced by both domains, then we should be able to prime perspective from the domain of space to the domain of time.

## Experiment

### Methods

63 Stanford students participated in the study. First, participants responded to 4 TRUE/FALSE spatial prime scenarios. Scenarios used either the ego-moving frame of reference shown in Figure 1 (predicted to map onto the ego-moving perspective in time), or the object-moving frame of reference shown in Figure 2 (predicted to map onto the time-moving perspective). On a separate page, participants were asked to read an ambiguous temporal sentence (e.g. "Next Wednesday's meeting has been moved forward two days.") and report on which day the meeting has been rescheduled. If the above target sentence is interpreted using the ego-moving metaphor, then *forward* is in the direction of motion of the observer, and the meeting should now fall on a Friday. In the time-moving interpretation, however, *forward* is in the direction of motion of time, and the meeting should now be on a Monday. There was also a control group which received no prime.

If the domains of time and space do indeed use the same perspective schemas, subjects primed in the ego-moving spatial frame of reference should prefer the ego-moving

perspective for time, and should think that the meeting will be on Friday. Subjects primed in the object-moving frame of reference should prefer the time-moving interpretation and think that the meeting will be on Monday.

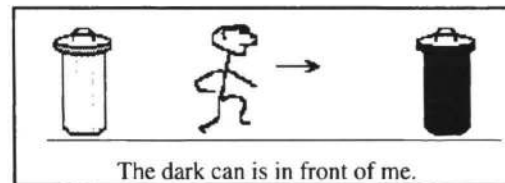


Figure 1: Sample ego-moving scenario.

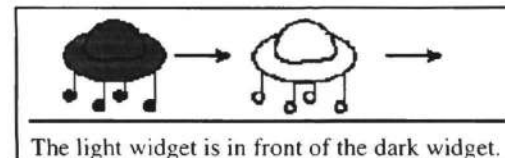


Figure 2: Sample object-moving scenario.

### Results

As predicted, participants responded in a prime-consistent manner. 73.3% of the participants that had been primed in the ego-moving frame of reference thought that the meeting was now on Friday. In stark contrast, 69.2% of the participants primed in the object-moving frame of reference thought that the meeting was now on Monday. Control participants were evenly split between Monday and Friday. A confidence measure confirmed the large consistency effect. These findings demonstrate a case of cross-domain priming of relational information, and suggest that the ego-moving and time-moving metaphors are indeed psychologically real conceptual metaphors. More broadly, this is some of the first empirical evidence for metaphoric representation.

### References

- Clark, H.H. (1973). Space, time, semantics, and the child. In T.E. Moore (Ed.), *Cognitive development and the acquisition of language*. New York: Academic Press.
- Lakoff, G. & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.