The Metaphors We Speak with Affect How We Think about Time and Space

Martín Lleras (m.lleras70@uniandes.edu.co)
Departamento de Psicología, Universidad de los Andes, Bogotá, 111711, Colombia.
Florencia Reali (f.reali96@uniandes.edu.co)
Departamento de Psicología, Universidad de los Andes, Bogotá, 111711, Colombia.
Camila Alviar (mcalviarg@unal.edu.co)
Departamento de Psicología Universidad Nacional de Colombia, Bogotá, 111711, Colombia
María Paula Bermúdez (mp.bermudez620@uniandes.edu.co)
Departamento de Psicología, Universidad de los Andes, Bogotá, 111711. Colombia

Abstract

A growing bulk of work indicates that we think about time in terms of space. Solving temporal ambiguities may involve adopting alternative spatial frames – namely time-moving vs. ego-moving perspectives. Previous work showed that people draw on either spatial perspective to disambiguate statements such as *Next Wednesday´s meeting has been moved forward 2 days* (Boroditsky, 2000). The ambiguity lies in the expression *move forward*, which can be translated into Spanish either as *adelantar* or as *mover hacia adelante*. A Spanish corpus analysis shows that, when these expressions are used to talk about time, the former is more frequently used to describe events moving towards the ego (time-moving perspective). We studied whether the use of these expressions influences the interpretation of ambiguous temporal statements in Spanish. Results from three experiments show that: 1.Both spatial schema primes and the choice of "move forward" translation constrain people´s interpretations of ambiguous temporal statements (Experiment 1); 2.The use of different metaphors to talk about *time* influences the solving of *spatial* ambiguities (Experiment 2); 3.Temporal primes containing no metaphorical forms fail to do so (Experiment 3). We conclude that the conventionalized use of expressions affects how people draw on spatial schemas when thinking about time and space.

Keywords: conceptual metaphor; ambiguous temporal statements; ego-moving/time-moving schemas; language use.

Introduction

The question of how people mentally represent time and space has been a recurring theme to which cognitive scientists have devoted much recent work. Conceptual Metaphor Theory suggests that abstract thought depends largely on metaphorical mappings from more concrete conceptual domains that emerge directly from perceptual representations such as spatial orientation or physical containment (Casasanto, 2010; Kövecses, 2010; Lakoff & Johnson, 1980, 1999). Time is an abstract concept that is not directly grounded on our physical experience, thus we may borrow spatial schemas to think about it.

Time and space representations seem to be asymmetrically dependent (Boroditsky, 2000; Lakoff & Johnson, 1980, 1999). Some evidence of the directionality of the space-time mapping comes from language use: we talk about time in terms of space as in periods of time being *long* or events being *ahead* of us. Linguistic forms used to describe spatial motion are also imported into time, as when

we say that a certain date *is approaching* or a meeting has been *moved forward*.

Cross-linguistic studies show that linguistic expressions of the TIME IS SPACE conceptual metaphor can be found in languages as diverse as English, Mandarin Chinese, Hindi, and Sesotho among others (Altverson, 1994). Across cultures people use spatial metaphors to describe time more frequently than time metaphors to describe space (see Kövecses, 2010, for a review).

There are two distinct space-time metaphoric systems in English and other languages: the ego-moving and the time-moving schemas (Clark, 1973; Boroditsky, 2000). In the ego-moving perspective we represent the individual moving across the time line walking into the future (e.g., *we are approaching the weekend)*. In the time-moving schema, we think about a static individual who is being "hit" by the time line – that is, events are represented as approaching the ego (e.g., *the weekend is approaching*). Boroditsky (2000) showed that ego-moving and time-moving scenarios used as spatial primes affected the way people thought about time. By contrast, temporal primes had no influence over spatial thinking. In a different study, Boroditsky and Ramscar (2002) showed how our experience of spatial situations (e.g., mentally simulating spatial movement or moving along a cafeteria line) had an effect on the type of spatiotemporal metaphors that are activated. People experiencing motion compatible with the ego-moving schema were more likely to use an ego-moving representation of time, while those that underwent the experience of an object moving towards them were more likely to activate time-moving schemas.

The importance of distinguishing between mental metaphors and linguistic metaphors has been pointed out (e.g., Casasanto, 2010). Casasanto and Boroditsky (2008) performed a series of psychophysical tasks, which did not require the use of language, showing that spatial stimuli interfered significantly with temporal judgments, while temporal stimuli had no effect on spatial judgments. These findings showed that spatial and temporal mental representations are asymmetrically dependent, as predicted by the directionality of space-time linguistic metaphors, even when tasks contained no linguistic materials.

Casasanto, Fotakoupoulou and Boroditsky (2010) studied the question of whether space-time representations are symmetrical in the first stages of development. They studied space-time mapping behavior in kindergartners and