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Cognition 102 (2007) 129–138
COGNITION
www.elsevier.com/locate/COGNIT

Brief article

The integration of figurative language and static depictions: An eye movement study of fictive motion ☆,☆☆

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Received 11 July 2005; revised 3 December 2005; accepted 8 December 2005

Abstract

Do we view the world differently if it is described to us in figurative rather than literal terms? An answer to this question would reveal something about both the conceptual representation of figurative language and the scope of top-down influences on scene perception. Previous work has shown that participants will look longer at a path region of a picture when it is described with a type of figurative language called fictive motion (*The road goes through the desert*) rather than without (*The road is in the desert*). The current experiment provided evidence that such fictive motion descriptions affect eye movements by evoking mental representations of motion. If participants heard contextual information that would hinder actual motion, it influenced how they viewed a picture when it was described with fictive motion. Inspection times and eye movements scanning along the path increased during fictive motion descriptions when the terrain was first described as difficult (*The desert is hilly*) as compared to easy (*The desert is flat*); there were no such effects for descriptions without fictive motion. It is argued that fictive motion evokes a mental simulation of motion that is immediately integrated with visual processing, and hence figurative language can have a distinct effect on perception.

☆ This manuscript was accepted under the editorship of Jacques Mehler.
☆☆ This research was carried out while both authors were postdoctoral researchers in the Stanford Psychology Department.

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doi:10.1016/j.cognition.2005.12.004

Keywords: Figurative language; Eye movements; Cognitive linguistics; Scene perception

1. Introduction

Our comprehension of a picture is more than the sum of its pixels; our comprehension of a sentence is more than the sum of its words. Both words and pictures need interpretation. When spoken words describe what we see in front of us, we must integrate these interpretations on the fly. How do these visual and verbal processes interact? Since Cooper (1974) demonstrated that eye movements are often directed towards objects referred to in speech, research has revealed a close integration of visual and linguistic processing (see Henderson & Ferreira, 2004; Trueswell & Tanenhaus, 2005). For example, visual processes are engaged during processing syntactic structure (Tanenhaus, Spivey Knowlton, Eberhard, & Sedivy, 1995), differentiating semantic roles (Altmann & Kamide, 1999) and resolving anaphoric reference (Runner, Sussman, & Tanenhaus, 2003), and the degree to which listeners' eye movements are coupled to speakers' reflects levels of comprehension (Richardson & Dale, 2005).

Yet studies of verbal and visual integration have focused on literal language. Even though figurative expressions are pervasive in everyday language and exist in all cultures (Gibbs, 1994; Lakoff, 1987), research has not addressed how figurative language affects the process through which we perceive the world. In the current experiment, we investigated how a scene would be perceived when it was described by forms of literal and figurative language that are reported to have equivalent meaning. If the mental representation of a figurative expression is identical to that of a literal expression, then there would be no difference between eye movement patterns. Similarly, if the mental representation of a figurative expression does not interact with visual processes, then there would be no difference between eye movement patterns. Therefore, any differences that are present in eye movement patterns can tell us about both the distinct mental representations that are evoked by figurative language, and the scope of the integration between visual and verbal processing.

2. Fictive motion

We chose to study a class of figurative spatial descriptions known *as fictive motion* (FM) sentences. Two examples are shown in (1a) and (1b).

(1a) *The road goes through the desert*
(1b) *The fence follows the coastline*

Pervasive in English and many other languages, including Swedish, Finnish, Italian, Chinese, and Japanese, the descriptions are figurative because they contain a motion verb but describe no motion (Huumo, 2005; Matlock, 2004a; Matsumoto, 1996).