

Do You Understand Spatial Terms Similarly?

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Abstract

When an addressee is the reference object predicated by a spatial term, does a speaker's assumption that the reference object is the addressee influence the speaker's comprehension of spatial terms? This study examined this point by using four Japanese spatial terms. Results indicated that such an assumption biased and changed the boundary defined by the spatial terms and that this bias might be equally processed independently of the locations of the located object during the judgment on the acceptability of the spatial terms.

Introduction

A sentence describing a spatial relationship with a spatial term usually includes at least two objects: the located object and the reference object. For example, consider "a cloud is floating above a mountain": the cloud is the located object and the mountain is the reference object. Former studies have shown the importance of particular information about the reference and located objects such as the function in the comprehension of spatial terms (Carlson & Kenny, 2005; Carlson-Radvansky, Covey & Lattanzi, 1999; Carlson-Radvansky & Tang, 2000; Coventry, Prat-Sala & Richards, 2001). However, they used artifacts as reference objects, and experimenters or experimental instructions have played the speaker's role and participants have been treated as addressees. As Herskovits (1986) stated, speakers believe that their addressees make assumptions similar to their own. Of course, addressees also believe the same thing. However, if a person is both the addressee and the reference object, will the speaker's comprehension of spatial terms be influenced by this fact? There are two possible forms a statement can take when we use a person as a reference object: If you ask person A, "Please pick up the ball *behind* you," person A (= you) is the reference object and the ball is the located object. Here, person A is both the addressee and the reference object. However, if you ask person B, "Please pick up the ball *behind* person A," then person B is the addressee and person A is the reference object. In the both cases, person A is the reference object. Our question was whether there would be any differences in the comprehension of spatial terms in each case?

In this study, it was hypothesized that the speaker's comprehension of spatial terms would be influenced by whether the reference object was also the addressee. We then examined how such information about the reference object changed participant's reaction time (RT) for

alternative judgment (yes/no) and the acceptability ratings distribution patterns for spatial terms.

Method

Participants

Forty native Japanese graduate or undergraduate students at Kyoto University participated. They were divided into two groups of 20 people, and each group was assigned to a different condition (addressee or not-addressee).

Materials

Four Japanese projective spatial terms were used: *mae*, *ushiro*, *hidari*, and *migi* (similar to *in front of*, *behind*, *to the left of*, and *to the right of* in English, respectively). They are basic Japanese spatial terms used in a 3-D space. The sentences used in this experiment were "*Akai tama-wa* ××-*ni aru-yo*" ("The red ball is ××"). One of the four spatial terms was assigned to ××. We did not express the reference object clearly in the sentences. This was because we told participants about the reference object in prior instructions, according to their experimental condition.

The stimuli were constructed and presented in a three-dimensional computer graphics (3-D CG) space. All stimuli contained the ground, a red ball (the located object), and a green character (the reference object).

We defined two conditions for the reference object: a not-addressee condition and an addressee condition. Under both conditions, participants were instructed to play the speaker's role in the experiment, and judge and rate sentences from the speaker's point of view. Under the not-addressee condition, participants were instructed about the reference object as follows: "This is an original character. Please take this character as the reference object in this experiment and imagine a situation in which you must let someone next to you know the location of the red ball in relationship to the character." Under the addressee condition, a participant was instructed about the reference object as follows: "Please take the character to be a human in a stuffed character suit and imagine a situation in which you must let him/her know the location of a red ball."

Procedure

Each participant was instructed about the reference object according to his/her condition (not-addressee or addressee). In each trial, a cross-shaped fixation point appeared at the center of the display window in the computer screen at the

