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Symposium on reference axes in language and space

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In order to be able to talk about what we see we may use both linguistic and spatial knowledge (Landau & Jackendoff, 1993). It is generally assumed that the use of directional terms like *front* and *back* not only involves linguistic knowledge, but also knowledge of reference axis representation and categorization (see Bloom et al., 1996). Although there seems to be agreement on the possible involvement of reference axes in spatial language use, there is no agreement about the way in which reference axes are represented, which axes are cognitively more prominent than other ones, how reference axes are categorized, and whether the representation and categorization of such axes is universal or not (see, e.g., Levinson, 1996). This symposium brings together four papers that take a different standpoint on these issues. The paper presentations are followed by a half hour discussion in which the paper presenters discuss their views. Other symposium participants are also invited to take part in the discussion. The purpose of the symposium is to bring more clarity in the factors that determine reference axis representation and categorization for the purpose of language.

Edward Munnich, Barbara Landau and Barbara Doshier (University of California) present two experiments with native English, Japanese and Korean speakers. These experiments show that subjects from these languages performed the same on language tasks and memory tasks for the representation and categorization of axes, that subjects from these languages performed in a similar way with respect to the notions of contact and support in the memory tasks, but also that in relation to contact and support subjects performed differently in the language tasks. On the basis of these results the presenters suggest that knowledge of axis representation and knowledge of contact and support are non-linguistic universals, that knowledge of axis categorization may be a linguistic universal, but that knowledge of the categorization of contact and support is different across languages.

Emile van der Zee (University of Lincoln) and Rik Eshuis (Graduate Program in Cognitive Science in Hamburg) present two separate theories on reference axis representation and categorization. They assume that both reference axis representation and categorization may be based on the spatial features of an object. In addition, they assume that the mechanisms for axis representation and categorization are universal, although reference axis labeling is not. Their theory on reference axis categorization assumes that the top-down axis is the most basic axis in spatial processing, followed by the front-back and the left-right axis (see, e.g., Tversky, 1996). Three experiments with

native Dutch speakers support these theories.

Urpo Nikanne (University of Oslo) presents linguistic research on the semantic representation of reference axes in Finnish and English. Drawing on examples of prepositional phrases that are used in motion expressions Nikanne argues that reference axes are represented in a semantic hierarchy. This hierarchy assumes that the front-back axis is the most basic axis, and that this axis is neutral with respect to verticality/horizontality, as long as no other axes are introduced. The next axis in the hierarchy is the left-right axis, projecting 2D entities in the horizontal plane. The top node in the hierarchy is the top-down axis, which projects 3D entities along the vertical.

Laura Carlson-Radvansky (University of Notre Dame) presents work that focuses on how the identity of verbally related objects influences the orientation and origin of a reference frame in one of these objects. One experiment shows that the functional relation of the objects involved influences how the axes of a reference frame are oriented. This experiment demonstrates a preference for defining axes with respect to an object when the objects are functionally related. Two additional experiments demonstrate that the identity and function of the objects impact where the reference frame is placed on an object for the purpose of describing the objects' spatial relation. These data implicate an additive combination of perceptual and conceptual factors for determining how reference frames are situated for language use (Carlson-Radvansky, in preparation).

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