

Explaining why MORE IS UP: Shared lexico-semantic and neurocognitive systems for the processing of spatial and non-spatial magnitude

Traditionally in psychology, the study of concepts has focused on concrete entities such as natural kinds and artefacts. Conceptual domains associated with less tangible aspects of experience, such as TIME, HAPPINESS, SOCIAL STATUS, WEALTH, MORALITY, and MAGNITUDE, are comparatively much less well understood. In contrast, work from the field of cognitive linguistics has paid considerable attention to our knowledge of abstract concepts, which has led to claims that our understanding of abstract concepts is based on our knowledge and experience of the spatial world. This claim has featured prominently in Conceptual Metaphor Theory (CMT; Lakoff & Johnson, 1980, 1999), which has explicitly argued for the mechanism of conceptual metaphor to explain how abstract concepts are based upon concrete spatial experience.

This paper addresses the theoretical and empirical issues for the claims of CMT, and concentrates on the evidence that abstract conceptual domains associated with MAGNITUDE are spatially structured by the concrete domain of VERTICALITY. The vertical domain is investigated because it has been extensively discussed in the cognitive linguistic literature, which has used evidence of lexical metaphors to make inferences about conceptual structure. Furthermore, there is mounting psychological evidence which demonstrates that spatial information associated with the vertical dimension is activated during both concrete and abstract language processing (Casasanto & Lozano, 2007; Meier & Robinson, 2004; Schubert, 2005), in gesture (Casasanto & Lozano, in press), in sign language (Taub, 2001) and in abstract reasoning (De Soto, London & Handel, 1965; Gattis, 2001).

This paper will explore the claims of CMT in detail in order to evaluate whether it provides a tenable theory of abstract concepts, and will look at the domain of MAGNITUDE in particular as a test case. This paper will argue that CMT has considerable theoretical problems, and its major tenets are insufficiently supported with psychological data. By an investigation of the correspondence between VERTICALITY and MAGNITUDE, it is argued that an alternative explanation to CMT for the similarities in linguistic structure of these domains and the psychological evidence is possible. The alternative solution offered is that the systematic correspondences that CMT seeks to explain are due to shared lexico-semantic and neurocognitive systems, rather than from metaphoric mappings from spatial to non-spatial domains. In lexical semantics, Jackendoff (1983, 1990) has argued that similarities between linguistic structures shown by language about concrete and abstract domains reveal a shared lexico-semantic system. In cognitive neuroscience, Walsh (2005) has proposed a shared system of magnitude processing (A Theory Of Magnitude) to explain similarities in the processing of space, time and quantity. This paper will unite these approaches and others in order to create a unified account of the linguistic, psychological and neuroscientific evidence that shows systematic correspondences between the processing and representation of spatial and non-spatial magnitude.

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