

Abstract

Title: Minding metaphors: Using figurative language in learning to represent
Language: English
Key words: metaphor, learning, knowledge formation, making sense, representing, reduction of complexity, science, popularization, psychology, anthropomorphizing, narrating, reification, category mistake, as if, meta-communicative markers, mindfulness
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The purpose of this thesis is to contribute to our understanding of the role of metaphor in learning and scientific reasoning. Metaphor is assumed to be fundamental for our learning and knowing. This issue is studied both on the level of scientific knowledge formation and on the level of individual reasoning and learning. The first part of the thesis consists of a general background of the issue, and of theoretical and methodological considerations. The second part of the thesis consists of four separate studies. The first study concerns the introduction, uptake, moulding, and use of one of the most famous metaphors in modern psychological theory, the metaphor of 'chunk.' By analysing scholarly articles on memory in leading psychological research journals, it was found that chunk was either taken as a static (reified) entity, or as a dynamic process (as chunking). It is argued that two different views of human abilities and capacities follow from this, one describing humans as severely limited in capacity and another describing humans as practically infinitely capable of expanding their knowledge and abilities. The second study shifts attention to scientific popularizations by analysing how the concept of 'DNA' is described and explained in two popular science magazines. It is found that anthropomorphic metaphors are functional in narrating scientific knowledge. From these metaphors, a view of humans as governed by infinitely small, but infinitely powerful, agents follows. The importance of distinguishing the representation from what is being referred to is emphasised. In the analysed material, however, these different 'levels' of description are often conflated, in which case a category mistake is made. The third study analyses the metaphors used in constituting a scientific theory and the subsequent difficulties that these metaphors may pose for learning and reasoning of students. The example studied is Darwin's theory of the evolution of species by means of natural selection. Anthropomorphic and teleological metaphors abound. It is concluded that the apparent simplicity of the theory (through its familiar metaphors) may in itself, in part, account for the empirically well-supported difficulty for learners. The fourth study, finally, re-analyses clinical interviews in the work of Jean Piaget. More specifically, the topic of analysis is how children qualify their answers. It is found that reasoning by 'as if' or by analogy are frequent. By analysing the children's answers in communicative rather than cognitive terms, a markedly different picture of the children's abilities and competences emerges. In learning to represent, the importance of simultaneously keeping a meta-perspective in mind is emphasised. Keeping the metaphorical quality of representations alive, finally, is hypothesised as one way of learning and knowing 'mindfully,' i.e., in learning to be open to learn anew.

Appendix: Transcripts and Commentaries