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Conceptual Metaphors and Tacit Models in the study of Mathematical Infinity

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Abstract

This work shows the connections between *conceptual metaphors* and unconscious, *tacit models* that benefit our understanding of mathematical infinity in the university classroom. It is argued that *conceptual metaphors* plays a key role in explaining how this mathematical concept is grounded in our experience and simultaneously provides a mechanism to address these *tacit models*. Moreover, it is shown that *conceptual metaphors* can be consistently understood in terms of these models, specifying obstacles and difficulties that teachers must consider when designing activities aimed at achieving an adequate understanding of mathematical infinity. This type of study allows us to improve our teaching practice, becoming aware and stimulating students to become aware of these models, by reflecting on the inconsistency of their own thoughts and intuitions regarding this mathematical concept. At the same time, it allows us to show students the validity of these inconsistencies by revealing how our cognitive processes are constrained by bodily-grounded experiences and motor-sensory perceptions determined by the morphology and the complexity of our human nervous system.

Keywords: cognitive linguistics; higher education; neuroscience