Meaning, Action, and History: Spatial Language as a Dynamic System

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Abstract: Empirical studies suggest that (a) language is grounded in action and (b) that the immediate past history of use influences how humans produce and comprehend spatial prepositions. We put these assumptions to the test by computationally modelling data from a spatial language task. The task required participants to place functionally related/unrelated objects on a screen w.r.t to a spatial preposition. Across participants, the amount of experience with placing objects was varied. The employed model was a variant of the dynamic field theory model that has successfully been applied to the A-not-B error task (Thelen et al., 2001). Since previous actions are an integral part of the representations in the original model, applying it to the spatial language data allowed testing the mechanisms underlying the (change of the) meaning of spatial prepositions. Yielding a tight fit, simulations support the idea that the meaning of spatial prepositions is dynamically grounded in actions.