

# The role of words in a developing grounded conceptual system

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We argue that framing the acquisition of words within a grounded conceptual system offers mechanistic accounts of several developmental processes. These include the emergence of perceivable mental representations and the generation of conceptual structures abstract from concrete sensorimotor experience. Drawing on grounded cognition's accounts of conceptual structure and the representation system and connectionism's mechanisms of statistical learning and parallel processing, we propose the following hypotheses:

First, we argue that without language, multisensory conceptual schemas that emerge via statistical learning are rarely perceived as mental representations, rather they predominantly serve to conceptualise perception (e.g. perceiving a Necker cube as a 3D object) and guide action (e.g. acting in a state of 'flow' with externally directed attention). When the acoustic forms of words are subsequently assimilated into schemas, words are able to cue schemas for structures not currently perceived by the representation system. With the lack of matching external structure to conceptualise, linguistically cued activity within the representation system is perceived as mental representation.

Second, the symbolic cueing of information by words forces the system to represent schemas cued by both environmental structures and linguistic symbols in parallel. Through learning statistical regularities across this parallel representation, new schemas emerge that refer to features shared across structures currently perceived by the sensorimotor systems and structures symbolically cued by language. We hypothesise that this is a mechanism for developing category systems abstract from concrete sensorimotor experience.