Attentional Anchors: Grounding Mathematical Concepts in Perceptual Solutions to Motor Coordination Problems

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Abstract

Cognition, per the embodied turn in philosophy, is active goal-oriented perceptuomotor engagement with the actual and/or imaginary world. What about mathematical concepts? Getting a grip on the nature of mathematical thinking is critical when we come to design technological environments for mathematics learning. Based on mixed-methods analyses of empirical results from a decade-long international collaborative research program, I propose that mathematical concepts are grounded in perceptual orientations — "attentional anchors" — which emerge spontaneously to facilitate the coordinated enactment of movements that solve challenging motor-control problems. During the presentation, I will invite the audience to participate in activities that simulate the Mathematics Imagery Trainer, our technological architecture for implementing the action-based genre of the embodied-design framework. My objective is to occasion opportunities for the audience to experience firsthand(s) what attentional anchors are, and how they bridge from handling the world to mathematical discourse.