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The Homeostatic Mind: A Developmental Study of Object Cognition (abstract)

Every day you interact in a world that presents itself as pre-divided into objects like baseballs, tables, chairs, and bicycles. Yet early in your past you experienced nothing more than an undifferentiated sensory onslaught. What changed to make it a world filled with objects for you? The world didn't change. You did. But how? The first part of this project is an answer to that question. The second part of the project grounds the first part in a general account of the mind and human behavior.

Commonsense has it that we discern a baseball because we can see it, grasp it, throw it, and hear it when it's struck by a bat. Commonsense is right. Our engagement with the world consists first and foremost of interactions with it (not computations over static representations of it). Our skill in discerning objects blossoms as our sensorimotor interactions mature. This is more than mere coincidence. Our understanding of an object is structured by those very sensorimotor interactions by which we come to know it. There is a small, but strong, collection of evidence showing that infants form an understanding of events *before* objects, developmentally, and that they initially understand objects only as experienced interactions. We see this in Piaget's "A-not-B error" where in order to replicate the experience of grasping some object an infant will recreate *the interaction* used to grasp the object previously, reaching to location A even when the infant can plainly see the object in a different location, location B! My claim, then, is that an object begins as nothing more than an experienced interaction. As a creature learns more ways of engaging the world, some learned sensorimotor interactions coalesce into a bundle. This 'interaction bundle' *just is* the object, from the creature's perspective. Later, a higher-order pattern emerges and the object comes to be understood as that *which underlies* these interactions.

If objects are initially discerned through interactions and interactions are executed under the control of an agent, then the discernment of an object demands behavioral control. This is captured by the Control Thesis: The degree to which an object exists for us is the degree to which we can control, through behavior, our perceptual experiences of it. Organisms don't merely passively discern objects; they evolved to *utilize* whatever they possibly could to successfully engage the world. Intentionality, then, is not mere passive representation but the active *utilization* of sensorimotor interaction bundles as part of *controlled* behavior. A complete explanation of object discernment and intentionality must, then, also provide a general account of behavior, as directed under the control of an organism.

The model for understanding control is homeostasis. Every physiological system is a homeostatic system. The mind is a physiological system. Therefore, the mind is a homeostatic system too. And every homeostatic system has the following features: a regulated parameter, a target goal state, a correction system; a large collection of underlying stable regularities; and an evaluation system. The regulated parameter is experience. The ever-present goal state of an organism is that dynamic subset of sensorimotor patterns that are primed by the organism's needs/values/desires. Every organism is engaged in a never-ending struggle to achieve goal equilibrium against the destabilizing forces of perceptual input and changing needs/values/desires. A Homeostatic Theory of Mind offers a framework for understanding the essence of human activity and the fundamental purpose of the mind—namely, to provide a powerful, flexible control system for successfully engaging the world. If this account is on track then the "language of the mind" is one written in sensorimotor interaction bundles.