

Research Statement

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My goal as a researcher is to explore questions about our beliefs in ordinary objects—the things we see, feel, and touch around us—and other composite objects like molecules and cells. For instance: how can we know about them, and what is the role of scientific knowledge in debates with those skeptical about objects? To this end, most of my work has focused on giving counterarguments against those who seek to instill skepticism about our perceptual beliefs. My main targets are eliminativists who hold that, in general, what we see are not macroscopic objects but groups of indivisible atoms working together to produce visible effects. My primary method has been to focus on how the needs and requirements of scientific explanation inform and constrain the debate.

My forthcoming publication in *Ergo* is a contribution to this program. Eliminativists sometimes invoke evolutionary debunking arguments against ordinary object beliefs, either to help them establish object skepticism or to soften the appeal of commonsense ontology. In this paper, I argue that object debunkers face a self-defeat problem: their conclusion undermines the scientific support for one of their premises, because evolutionary biology depends on our object beliefs. Using work on reductionism and multiple realizability from the philosophy of science, I argue that it will not suffice for an eliminativist debunker to simply appeal to some object-free surrogate theory of evolution that results from converting any scientific proposition about some object *K* into a proposition about simples arranged *K*-wise. In the process, I examine some hazards peculiar to eliminative reductions of scientific theories. This paper is intended to define and develop the object debunker's self-defeat problem for further study, and to clarify some of the ways sparse and abundant ontologies interact with scientific theory.

In my dissertation, I also develop and evaluate several externalist strategies to resist object debunking arguments, I develop an argument argue that ordinary objects are indispensable to the sciences, and I argue against the view that our perceptual beliefs about the external world are misleading because evolutionary strategies for maximizing fitness always beat those for accurate perception. I am working on publishing these three chapters as individual papers, so I will describe each in more detail.

Paper 1: Externalists about mental content hold that the content of our belief *that there is a tree there* is partly determined by a causal-historical relationship between our term 'tree' (and our concept *tree*) and its referents to certain kinds of things in the external world. Some externalists argue that this connection secures the truth of existential beliefs about trees even if we're radically incorrect about what trees are—say, if atoms arranged treewise do not actually compose anything—and that this means debunking arguments against things like trees will be unsuccessful. Other externalists seem well-situated to reply to the evolutionary debunker by providing a counter-story—an account of why our visual perceptions evolved to get things *right* about ordinary objects like trees. In this paper, I explain why this first strategy is doomed to failure, and why the second one promises to meet the debunker's challenge. Along the way, I answer an objection from the debunker that our visual representations of trees *really* track something else, like particles arranged treewise, by misrepresenting them as trees. This paper serves to develop and unify the discussion in the literature of externalist responses to

evolutionary debunking arguments, to provide future direction for the most promising externalist responses, and to counter some criticisms in the literature.

Paper 2: One of the central points at issue when considering evolutionary debunking of ordinary objects is the role our beliefs in such objects play in our scientific knowledge. Are ordinary objects indispensable for science? If so, then scientific arguments can't be aimed at establishing skepticism about them. In this paper, I lay the foundations for answering "yes" to this question. Since indispensability arguments have mainly been developed for mathematical entities like numbers, I review this literature and show that by any standard we would use to judge numbers indispensable, ordinary objects are even better candidates. The most important of these standards is explanatory indispensability. I argue that objects like baseballs are explanatorily indispensable in more ways, and to a greater extent, than numbers like 13. I answer an objection to the indispensability of ordinary objects in causal explanations that holds that such objects are mere causal overdeterminers, and should thereby be rejected. This paper addresses a gap in the literature by explicitly arguing for the indispensability of ordinary objects, and situating the argument with the existing literature on mathematical indispensability.

Paper 3: In this paper, I engage with a recent, highly visible example of an evolutionary debunking argument against our perceptual beliefs put forth by the cognitive scientist Donald Hoffman. It is distinguished by its heavy engagement with the scientific literature, especially from visual perception and evolutionary game theory, and its novel response to the sort of self-defeat worry I raise in my forthcoming *Ergo* paper. According to Hoffman it is a theorem of evolutionary game theory that traits for enhancing inclusive fitness consistently beat those for having true perceptions; this entails a kind of general skepticism about our perceptions of the external world. Because the argument is mathematical in nature, it does not rely on empirical evidence and so purportedly escapes self-defeat. I argue that the Fitness Beats Truth theorem relies on some unacknowledged empirical assumptions, and that even if his argument is successful, his conclusion is a vacuously true conditional about human beliefs. I argue that even if some abstracted form of universal Darwinism is true in any domain that meets the criteria, it does not follow that such a theory gives grounds for perceptual skepticism. This paper serves to define some limits for evolutionary debunking arguments in the literature by engaging with an extreme global skepticism, and to clarify the empirical nature of evolutionary theory and its relationship to its mathematical subfields.

Moving forward, I want to explore a host of issues at the interface of metaphysics, epistemology, and the philosophy of science—particularly of contemporary evolutionary biology. What is the special role of composite objects (both living and unliving) in biological explanation? How does a thoroughgoing Darwinism inform the special composition question? What are its consequences for natural kinds like species? How does it constrain the problem of personal identity, and what does it mean for the metaphysics of artifacts? What in general is the structure, and what are the inherent limits, of the various kinds skepticism inspired by contemporary evolutionary science? If Darwinism is universalizable to different domains (including, e.g., language and culture), does this relieve it of a dependence on evidence from any particular domain? I see my continuing project as using a fresh round of skeptical challenges in the literature to stimulate a reconsideration of fundamental issues in the philosophy of biology.