

A thesis

entitled

Inherited Ontologies and the Relations between Philosophy of Mind and the Empirical  
Cognitive Sciences

by

Christopher A. Rickels

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the Master  
of Arts Degree in Philosophy.

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May 2013



An Abstract of

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A productive relationship between the philosophy of mind and the empirical cognitive sciences not only is possible, but also is pursued productively by practitioners from both sides. In the first two chapters, I consider two examples of sets of concepts (“folk psychology” and the “architecture of the mind”) which are shared between the philosophy of mind and the empirical cognitive sciences and analyze them from both perspectives. I introduce a historical-analytical apparatus called “inherited ontologies” to track these sets of concepts and how they emerge, mutate, and replicate over time in order to show that what can begin as semantic opacity can end as ontological confusion. I argue that the important question is not whether we inherit our implicit ideas about the mind from our genes or our culture, but how shared inheritance manifests in different ways in different individuals. In the third chapter, I argue that the plurality of kinds of minds should inform how we research our minds. Instead of supposing that a plurality of approaches to study a plurality of minds is a problem to be solved, we should embrace cognitive and methodological diversity as not only possible but desirable in a shared problem space. The cognitive sciences should develop a unity of purpose without collapsing into a presumed uniformity of subject matter.

For Kayla. I'm lucky to have someone who never stopped believing in me.

## **Acknowledgements**

I am grateful to my many supporters throughout this process. Some believed I would finish the document on time. Some were less certain. To those of the former category – thank you. To those of the latter category – thank you. What else could I say? Thanks to my thesis adviser, Dr. Madeline Muntersbjorn; my committee members, Dr. John Sarnecki and Dr. Stephen Christman; and to a departmental reader Dr. Susan Purviance.

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## Preface

On May 7, 1959 scientist and author C.P. Snow delivered a talk to the Senate House at the University of Cambridge which would later be published as *The Two Cultures and the Scientific Revolution*. For Snow, the intellectual world had been dividing itself into two separate realms such that people in one realm were becoming incapable of meaningfully interacting with those in the other realm. In fact, he recounts examples of outright hostility in some cases. The two realms Snow details are the sciences and the humanities. And while it may be that Snow overstated his case at the time, the challenge inherent in what he identified as the problem of two cultures has not gone away. In a recent opinion piece in the New York Times, biologist E.O. Wilson (2013) wrote,

The task of understanding humanity is too important and too daunting to leave to the humanities. Their many branches, from philosophy to law to history and the creative arts, have described the particularities of human nature with genius and exquisite detail, back and forth in endless permutations. But they have not explained why we possess our special nature and not some other out of a vast number of conceivable possibilities. In that sense, the humanities have not accounted for a full understanding of our species' existence (Wilson, 2013).

While I agree with Wilson's claim that understanding humanity is too important and too daunting to leave to the humanities alone, the sciences are similarly incapable of understanding humanity on their own. We need both. In this thesis, I consider what the humanities might give to the sciences and the sciences might give to the humanities in a common search for what Wilson calls "a fuller understanding of our species' existence".

Now, since a map of all logically possible reciprocal exchanges between the constitutive disciplines of the humanities and the sciences would be cartographically complex, we must think at a more manageable level. The level I inhabit in this thesis is one between a single subdivision of a humanities discipline, the philosophy of mind, and a collective of related sciences, the empirical cognitive sciences.<sup>1</sup>

Two such reciprocal exchanges between the philosophy of mind and the empirical cognitive sciences are (1) explanations and analyses of the relationships between the philosophy of mind and the empirical cognitive sciences (Churchland, 1986; Lakoff, 1989; Gray Hardcastle, 1996; Bechtel, 2009; Thagard, 2009) and (2) support for a re-evaluation of the goals of philosophy of science as a project dedicated to human values beyond the purely epistemic to both science and society (cf. Douglas, 2010). On point one, my explanation and analysis goes beyond mere description as one might expect of a traditional philosophy of science which seeks to study scientists like an ornithologist studies birds. A quote, usually attributed to Richard Feynman, goes something like, ‘philosophy of science is about as useful to scientists as ornithology is to birds.’ My analysis recognizes and encourages active engagement between philosophy and science. On point two, the social dimensions of science as both product and process are of concern in this thesis because I recognize the impossibility of segregating science from its environment for philosophical investigations. What I mean by this last sentence is that the success of science, the influence of science, and the continued life of science are dependent upon the society in which a science operates. In

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<sup>1</sup> I use the plural form “sciences” here to emphasize that there is no identifiable unified discipline at this time. I use the term “*empirical cognitive sciences*” to refer to those disciplines which rely on empirical methods and data; use statistical methods; and receive grants from institutions like the National Science Foundation, National Academy of Sciences, and so on. The term “empirical” is being used in a restricted sense. Philosophy (in general, but philosophy of mind in particular) is generally considered a cognitive science, but does not meet my standards for “empirical”. Hence, when I use the term “Cognitive Science”, I refer only to the empirical cognitive sciences in a narrow sense, but when I use the term “cognitive sciences”, I refer broadly to all disciplines constituting the cognitive sciences including the philosophy of mind.



Chapter 3 I address this relationship as it specifically relates to the cognitive sciences and society.

E.O. Wilson offered us a polite version of the Two Cultures problem, but some commentators have more “boldly” asserted that, one, philosophy and science do not work well together and, two, the suggestion that they could is simply preposterous. Recently in an interview Arizona State University theoretical physicist Lawrence Krauss stated,

Philosophy is a field that, unfortunately, reminds me of that old Woody Allen joke, "those that can't do, teach, and those that can't teach, teach gym." And the worst part of philosophy is the philosophy of science; the only people, as far as I can tell, that read work by philosophers of science are other philosophers of science. It has no impact on physics what so ever, and I doubt that other philosophers read it because it's fairly technical. And so it's really hard to understand what justifies it. And so I'd say that this tension occurs because people in philosophy feel threatened, and they have every right to feel threatened, because science progresses and philosophy doesn't (Anderson, 2012).

This view of philosophy of science is problematic and has been rebutted elsewhere (Pigliucci, 2012). Pigliucci, though, suggests that philosophy of science does not answer scientific questions; rather, it seeks to understand how science works. This seems to suggest, *prima facie*, that philosophers of science simply explain the mechanisms of science. I share Pigliucci's criticism of Krauss, but Pigliucci's view descriptively presumes a detachment of science from philosophy and normatively it implicitly elides the logical possibility of positive and engaged philosophical and scientific interaction.

The detachment of science from philosophy is the second point I should like to make. The implication of Krauss's statement is that philosophy is somehow subservient or inferior to science and, further, that they are incommensurable. By

incommensurable, I mean that they both seek to explain the same domain, but that their methods and vocabulary are such that they cannot adequately share information between them. Krauss's thinking demonstrates an error of understanding interdisciplinary possibilities which I wish to clarify in this work.

In the previous sections I widened my scope to discuss normative goals for philosophy of science and science, but let us narrow again to my particular interaction of interest: the philosophy of mind and the Cognitive Sciences. How we conceptualize relations (both actual and possible relations) between the philosophy of mind and the Cognitive Sciences will determine how progress in both domains is measured. This makes sense simply in terms of how assessment, as an evaluative tool, works – we define our desired outcomes and develop solutions to reach those outcomes. The motivation for my project is to show that current collaborations between philosophers of mind and Cognitive Scientists are fruitful and that there are even more opportunities to be had at the juncture of philosophy of mind and the Cognitive Sciences. My view that the philosophy of mind and the Cognitive Sciences can and do positively interact is held concomitantly with the view that extant historical philosophical problems are closely related to problems the empirical sciences face.<sup>2</sup> By historical philosophical problems, I mean conceptual problems within the discipline of philosophy which have a history of many different people working on them and continue to be a problem even to the contemporary period. For instance, the nature of thought, mental representation, mental architecture, the “laws” of thought, and so on are examples of historical philosophical problems. What I do not mean to suggest by extant historical

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<sup>2</sup> This point will no doubt be highly contested by some philosophers and some scientists. Thanks to philosopher Dr. John Sarnecki for suggesting that what binds the cognitive sciences is a common interest in theories of *representation* and cognitive neuropsychologist Dr. Stephen Christman for articulating how representation is instantiated in his own field.

philosophical problems are arcane conceptual problems which were isolated in a period of philosophical history – e.g., how many angels can dance on the head of a pin? Now, according to my view that historical philosophical problems are closely related to problems in the sciences, we in the cognitive sciences concurrently inhabit what I would like to call a *shared problem space*. It is our joint task to determine the boundaries, rules, assumptions, and heuristics in this shared problem space and, further, to agree that multi-modal solutions are the most fruitful. By multi-modal, I refer to the idea that solutions to a problem must take into consideration a number of variables. An example would be instructive at this juncture. Consider the problem space of Alzheimer’s disease. It is true that Alzheimer’s disease is a neurological disorder and a pharmacological solution which treats the physical causes would be a welcome development. However, an exclusive search for a biochemical solution ignores the social dimensions of the Alzheimer’s problem space as experienced by both sufferers and caregivers. In other words, our best solutions to problems will consider more than one dimension of a shared problem space. The range of cognitive sciences, most broadly construed, will consider the social, medical, cognitive, and ethical dimensions of human cognition. At this point the burning question ought to be, “how might the philosophy of mind and the Cognitive Sciences interact?” I think there are at least three possible options.<sup>3</sup> By exploring these possible relations we can engender new and more refined questions about how the cognitive sciences could theoretically proceed.

A first possibility represents a logical extreme, namely, the eliminativist-scientist view. It is not clear whether or not any single individual holds the following view, but, generally it is a logically possible view attributed to a certain group in the aggregate. These

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<sup>3</sup> Van Gelder (1998) proposes seven: The pioneer, the building inspector, the Zen monk, the cartographer, the archivist, the cheerleader, and the gadfly.

individuals may deny the eliminativist-scientist view, but it is a general orientation and it maps onto their solutions to problems as couched in empirical scientific terms only. Generally, eliminativist-scientists overstate the epistemic power of the Cognitive Sciences and ignore the philosophical problems in scientific methods, findings, and implications. The distillation of this orientation is one which is disdainful of philosophy's historical prominence in the realm of belief, mind, and thought. We considered Lawrence Krauss's eliminativist-scientist view above, but his remarks were restricted to the philosophy of physics. Individuals who extol the explanatory power of the neurosciences and support eliminativism/reductionism of philosophy are Sam Harris (2010), E.O. Wilson (1998), and Michael Shermer (2013).

A second possibility of a relation between philosophy and the empirical sciences is what I should like to call a "data-base" view. The database view suggests that the Cognitive Scientists first generate data and then the philosopher of mind uses that data to inform, or shed light on, particular philosophical questions. An example of someone posing this relation between philosophy of mind and the Cognitive Sciences is Patricia Smith Churchland. Her 1986 book *Neurophilosophy* stands at the extreme end of the continuum of the data-base view. Churchland argued that the growing body of research in the theoretical, computational, and cognitive neurosciences would serve to answer a number of vexing philosophical issues in philosophy of mind. In subsequent work, she extended and extolled the power of the neurosciences to solve problems in epistemology, personal identity theory, and philosophy of religion (2002) and later on the foundations of human morality (2011). Churchland sought to use science as a way to knit an entire explanatory system that would render much past speculation about the mind and mental properties as moot. A more

modest view of a data-base relation, for instance, was Alvin Goldman's (1967) "A Causal Theory of Knowing". This paper was an early attempt to both respond to Gettier problems and present a more scientific epistemology.<sup>4</sup> Goldman (1967) writes,

Remembering, like perceiving, must be regarded as a causal process...Of course, not every causal connection between an earlier belief and a later one is a case of remembering. As in the case of perception, however, I shall not try to describe this process in detail. This is a job mainly for the scientist. Instead, the kind of causal process in question is to be identified simply by example, by 'pointing' to paradigm cases of remembering (p. 72).

This passage suggests Goldman finds a scientific account of perception adequate for use within his larger theory of knowing. Notice Goldman is not suggesting a relationship of identity between descriptive accounts of knowledge/belief (psychology) and normative accounts of knowledge/belief and privilege (epistemology) or that either one ought to be privileged; rather, he suggests that the scientist is in a position to develop an account of perception and it fits nicely in his causal account.

A third possibility is that philosophers are interested in scientific findings to determine and direct the preconditions of that empirical science. For instance, consider the work being done by philosopher of psychology Edouard Machery (2005). While Machery is certainly interested in the history of philosophy and extant philosophical problems, I am not willing to grant that he thinks using data from the Cognitive Sciences will solve or dissipate philosophical problems *in toto* (thus he does not seem to think that a more complete science will absorb philosophical questions). In addition, I do not think he is using science simply as a data-base for his own views on concepts (thus he is not a data-base philosopher). Rather, his goal is to criticize one of the foundational theoretical principles of cognitive psychology and to set new preconditions for empirical research. In fact, at the close of his article,

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<sup>4</sup> I do not use the term "naturalized epistemology" here because it had yet to be coined (cf. Quine, 1969).

"Concepts are not a Natural Kind" he writes, "Psychologists should focus instead on other classes of mental representations, particularly prototypes, exemplars, and theories (and eventually others)" (p. 465). Thus, Machery regards the relation between philosophy and science as the former specifying the metaphysical precondition of the latter. I support his characterization of the relationship between the philosophy of mind and the Cognitive Sciences as an improvement over the eliminativist-scientist view and as an important companion to the data-base view. Asserting that philosophy sets the metaphysical preconditions for empirical science is a contentious claim, but I argue throughout this thesis that the metaphysical preconditions for empirical science model of understanding the relations between philosophy of mind and the Cognitive Sciences is the most efficacious.

In Chapter 1 we will turn our attention to the philosophy of mind and the emergence of folk psychology as a philosophical concept. I detail its conceptual development from the four traditional areas of inquiry within the philosophy of mind: epistemological, semantic, ontological, and methodological. As we will see, it is difficult to adequately separate out folk psychology into these areas. I show that folk psychology is a troublesome concept and requires meaningful interaction among the cognitive sciences to ensure that philosophical speculation on folk psychology does not amble into conceptual obscurity and that empirical investigation into folk psychology neither confines itself to confirming platitudes nor producing unsubstantiated grandiose findings. I also discuss how some researchers in the cognitive sciences have successfully performed cooperative work between metaphysical preconditions and empirical data.

Now, *prima facie*, it may seem that talk of metaphysical preconditions of concepts (like folk psychology or the architecture of the mind) suggests that philosophers need to be

involved in the reification of Kuhnian (1962) paradigms and revolutions, Lakatos's (1973) research programmes and hard cores, or Laudan's (1977) research traditions, but I do not think this reification follows. Let me explain what I mean. Neither my discussions of folk psychology in Chapter 1 nor my discussion of the architecture of mind in Chapter 2 are meant as discussions of working metaphysical paradigms for empirical research in the same way that Kuhn himself talked about these paradigms. Nor am I attempting to settle post-Kuhnian tensions between socio-cultural constraints and genetic endowments. Instead, I continue to explore the interdisciplinary territory in the tradition of Immanuel Kant. Kant (1781/2007) first supplied philosophers with an explicit vocabulary of metaphysical preconditions for empirical science, but he did not decide issues of cultural constraint and genetic endowment. Obviously Kuhn and others were inspired by Kant, but they moved to decide the issue in favor of socio-cultural institutions.

In Chapter 2, I present and analyze the concepts which have developed in relation to the architecture of mind. The most common concepts are nativism and empiricism. From these common ancestors, a number of other theoretical frameworks have come into existence between the cognitive sciences and those have been refined over time also. The goal is to consider relations between the philosophy of mind and the Cognitive Sciences from a historical perspective. Chapter 3 continues to move forward while looking back by emphasizing the value of intellectual history in contemporary theorizing so we avoid reifying concepts introduced for semantic clarity in unnecessarily cluttered ontologies. A historical analysis also serves to make the implicit explicit. History can illuminate contemporary problems in ways previously implicit or even unthinkable. My suggestion is not that historical analysis is a supplementary value for traditional epistemic values, but that it ought

to be taken into consideration when navigating complex interdisciplinary problem spaces. I begin Chapter 1 by considering the relationship between biology and the philosophy of biology as one instance of a relationship between philosophy and science before reasoning, by analogy, to the relationship between philosophy of mind and the Cognitive Sciences.



## Chapter One

### An Etiology of Folk Psychology

Before discussing the relationship between the philosophy of mind and the Cognitive Sciences, let us consider the relationship between philosophy of biology and biology. A possible starting point for contemporary philosophy of biology is evolutionary biologist Ernst Mayr's frustration with what he saw as the logical positivist emphasis on logic, mathematics, and physics in Anglo-American philosophy of science.<sup>5</sup> Mayr wrote on the importance of unique problems in biology and was instrumental in undermining essentialist/typological and teleological species concepts in biology (Haffer, 2007). Furthermore, Mayr famously argued for the autonomy of biology from the physical sciences via dual causation – the necessity of functional-environmental proximate explanatory causality and historical-evolutionary distal explanatory causality (Mayr, 1961). Mayr's philosophical contributions to conceptual problems in the burgeoning field of the philosophy of biology continue to be developed both by philosophers (Kitcher, 1984; Pigliucci, 2003) and biologists (Hey, 2001; de Queiroz, 2007). Mayr's sensibility, which spans both biological questions and philosophical problems, is admirable since it requires knowledge spanning two disciplines and valuing their mutual interaction. By reason of

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<sup>5</sup> Recent scholarship challenges the view that logical positivism ignored biology (Byron, 2007).

analogy, the same kind of relationship which I have detailed between philosophy of biology and biology is viable between the philosophy of mind and the Cognitive Sciences.

Returning from the analogy to this discussion, we can see the different ways in which philosophy and sciences interact. The metaphysical preconditions and empirical scientific practices interact in the philosophy of mind and the Cognitive Sciences in different ways. On the one hand, traditional philosophy of mind analyzes or considers the nature of minds, what sort of external content minds interact with and how the external content becomes internal, how internal content interacts, and even the metaphysical assumption that content can be dichotomized into external and internal in the first place. On the other hand, the Cognitive Sciences empirically investigate the ways in which minds systematically take information in and systematically produce novel information, the ways in which input and output affect behaviors, what mechanisms exist to perform information processing, and so on. The methodological disparity between these two modes of inquiry results from the institutional split between philosophy and psychology at the dawn of the 20th C. The two disciplines subsequently constructed their own professional organizations and organizational norms. Prior to this institutional split, according to Fodor (1975), there existed a discipline called 'speculative psychology'. He writes,

It wasn't quite philosophy because it was concerned with empirical theory construction. It wasn't quite psychology because it wasn't an experimental science. But it used the methods of both philosophy and psychology because it was dedicated to the notion that scientific theories should both be conceptually disciplined and empirically constrained (p. vii).

Furthermore, Fodor acknowledges that neither philosophy of mind nor psychology lost the speculative element, "Empirical psychologists continued to design their experiments and interpret their data in light of some conception, however shadowy, of what the mind is like"

(p. vii). Conversely, the same holds true for philosophers who nonempirically analyzed concepts, “a general consonance with the facts about mental states is an acknowledged condition upon theories of the logic of mental state ascription” (p. vii). While the distinction between the metaphysical preconditions by traditional philosophy of mind and the experimentalism/modeling of Cognitive Sciences was made during the early 20th C. philosophy-psychology split, it has become blurred by the naturalistic turn in Anglo-American philosophy led by Dan Dennett, Paul and Patricia Churchland, Bill Bechtel, Ned Block, Jerry Fodor, W.V. Quine, and countless others. I am uncertain whether or not most have returned to the same kind of theorizing as was done before the split. I am inclined to say no. According to Thagard (2012), some philosophers think the naturalistic turn has not been fully realized. He suggests that the methods of science ought to be more explicitly used in philosophical thinking. This work is rigorous but not arbitrarily narrow. Our goal should be to develop theories in the Cognitive Sciences which are both, to borrow Fodor’s terminology, *conceptually disciplined* and *empirically constrained*.<sup>6</sup> I will begin in Chapter 1 by sorting out a concept which is a candidate for conceptual discipline: Folk psychology. My strategy is to offer a detailed and thought-provoking historical etiology of folk psychology as both an explicit and implicit actor in the cognitive sciences.

### **Section 1.1: Folk Psychology as a Fact to be Explained**

Much of late 20th C. analytic philosophy of mind was concerned with the nature and status of *folk psychology*. A tangled, confused, and oftentimes frustrating concept for philosophers, folk psychology has been variously termed “commonsense psychology”, “naïve psychology”, “Person-Theory of Humans”, “intentional psychology”, or

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<sup>6</sup> The desiderata of conceptual discipline and empirical restraint are found at least in one other academic work (cf. Daddesio, 1994).

“mindreading” in both the philosophy literature and psychology literature. Typically people who talk about folk psychology need to offer explicit definitions of their terms since there is such a wide range of possible options for what one means by “folk psychology”. This attention to detail with respect to what folk psychology denotes is less a worry over abstruse minutiae and more a recognition of tension between clashing academic circles in the philosophy of mind over the status of folk psychology and how seriously we should even take it. Now, in psychology and other cognitive-behavioral disciplines the preferred term is “Theory of Mind” (ToM). Many philosophers have variously used ToM in their writings, but its denotation does not entirely map onto what we mean by folk psychology in contemporary analytic philosophy of mind. I will opt for “folk psychology” as it appears in the literature most often as a quasi-scientific theory of human cognition used to both predict and explain outward behavior (Stich & Nichols, 1992). This quasi-scientific theory has also recently been termed the “theory-theory” of folk psychology since, overall, it is a theory, but that theory supposes that humans mentally represent a theory of human action (and of various other worldly phenomena). This mentally represented quasi-scientific theory, hereafter QS, is constituted by a set of universal nomic relations between mental content and behavior (Churchland, 1970). The QS theory can be contrasted with another popular sense of folk psychology: The socio-cultural sense, or SC sense, which denotes the litany of terms we have in a vocabulary and daily discourse about minds and behavior and, in addition, how this mind-talk undergoes constant change. Folk psychology in the SC sense includes, the widely circulated yet evidentially unsubstantiated claims that “people use only about 10% of their brains” or that “schizophrenia means split personality” (Standing and Huber, 2003). SC folk psychology can also include radical ontological shifts in thought such as, Freudian speculative psychology and the enlargement of our vocabulary about human desire to

include reference to a mysterious unconscious realm. According to this kind of folk psychology, our mind-talk reflects our particular socio-historical milieu. Importantly, we must be cognizant that both the atemporal QS theory sense of folk psychology and the historically-situated SC sense of folk psychology are born of the same minds. While it would be mistaken to uphold a rigid distinction between these two kinds of folk psychology, I cannot address the latter sense of folk psychology in the same kind of detail as with the QS theory, so I shall proceed with a history and analysis mostly of the former only too conscious that I am showing how supposedly atemporal understanding of how minds work has changed over time.

My history of folk psychology as a quasi-scientific theory will be developed in three sections which closely track the four traditional problem spaces in the philosophy of mind: epistemology, semantics, ontology, and methodology. The next section will address the semantic problems inherent in folk psychology, the section after that will address the ontological problems, and the last section will address methodological problems as one moves from a QS theory of mental life given by philosophers of mind to a testable theory of mental life applied by those in the Cognitive Sciences. The point, as we will see, is to show how philosophical conceptions of folk psychology have both emerged and evolved.

## **Section 1.2: Minds and Meanings**

In this section, we will see the first emergence of folk psychology and how it has evolved in a particular problem space both semantically and epistemologically. The first instance of a philosophically developed concept which we might like to call folk psychology, call it, *proto-folk psychology*, was in Wilfrid Sellars' 1956 paper "Empiricism and the Philosophy

of Mind”.<sup>7</sup> Sellars (1912-1989) was a leading American epistemologist and philosopher of mind<sup>8</sup> in the naturalist tradition on the cusp of a number of Western philosophical traditions – British ordinary-language philosophy, American pragmatism, Anglo-American analytic philosophy, and a scattered Austrian logical positivism. Sellars wrote in a transitional period of philosophy of mind, language, and epistemology as the above listed traditions somewhat withered. The change in perspective and method that Sellars actively participated in is typically referred to as the *naturalistic turn* in philosophy. While it certainly affected the overall tone and argumentative strategies of many different philosophers, it was neither monolithic nor comprehensive. Some philosophers largely held to the standards and practices of analytic philosophy, i.e., thought experiments, logical analysis, and the analysis of language. Others broke with this tradition in favor of incorporating or even adopting the methods and findings of the sciences.

For Sellars, the problem to be solved was to develop an account of a justificatory theory of empiricism which was not beset by problems inherent in earlier theories which derived justification from the structure of classical Cartesian foundationalism (O’Shea, 2007). Note, however, that most accounts of Descartes’ epistemology are themselves selectively read from his work. Descartes is generally credited with developing the concept of the “thinking thing”, or, the human being as an epistemic agent whose solid foundation for knowing anything is to first know oneself through perfect access to one’s own immaterial mind.

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<sup>7</sup> Its first usage, though, can be traced to Wilhelm Wundt (1912/1916), the German philosopher and psychologist who developed *Volkerpsychologie* which translates as folk-psychology.

<sup>8</sup> Epistemology and philosophy of mind were not as distinctly individuated as they are now. The current subdivisions within philosophy merely reflect historically erected boundaries which most continue to work within (they are neither binding nor arbitrary).

Classical foundationalist epistemologies attribute ontological status and doxastic access to conscious mental states. By a conscious mental state, I mean something homologous to a particular cognitive event at a particular moment in time. The cognitive event contains content about the world and is represented to the self.<sup>9</sup> Usually, this content is in the form of a belief  $p$ . A classical foundationalist account of epistemology presumes that conscious states are an actual event inside of one's own head. Finally, doxastic access means that a classical foundationalist assumes that all of one's beliefs and evidential justification for those beliefs are perfectly accessible to a rational agent's conscious mind at any given time  $t$ .<sup>10</sup> Now, doxastic access is both an epistemological and semantic problem since the classical foundationalist assumes that: (a) one knows and is incorrigible about conscious states and their terms at any given time  $t$ , and (b) the meaning of a mental content term is definable strictly by inner ostension (the semantic horn). By inner ostension, I refer to the capability of an agent to define a term simply by pointing to it or noninferentially<sup>11</sup> referencing it (this defines 'ostension') based on introspection or her inner *feeling* or inner *experience* (this defines 'inner'). The problem, here, is that classical foundationalism is committed to *semantic solipsism*, or the idea that knowledge of other people's mental state terms is strictly impossible since I have access only to my own immediate experience. The classical foundationalist account of epistemology, fraught with problems, was unsatisfactory for Sellars who sought a better justification for an adequate empiricism. His search led him to speculate about the origins of our folk psychology and how we might have come to associate certain mental states with particular behaviors.

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<sup>9</sup> This is a very basic definition but one which satisfies the current purpose. A deeper analysis will find that all of the terms used in this definiens are fraught with historical theoretical imports which are themselves subject to critique.

<sup>10</sup> Doxa is from the Greek, δόξα, which translates as "belief".

<sup>11</sup> A noninferential belief is one which requires no other beliefs to justify it.

Through a thought experiment, he asks us to envision a world in which proto-humans he calls Ryleans (1956, p. 48), a reference to fellow epistemologist Gilbert Ryle, have a semantically and syntactically adequate object language and an ordered metalanguage<sup>12</sup> for public objects and public events, but lack any such language for mental concepts. Sellars supposes that perhaps one such Rylean ancestor, the genius Jones, begins to question why his fellow Ryleans often partake in behaviors counter to his own. Jones, upon questioning his comrades, finds that others are capable of giving reasons for their actions and then begins to infer that even when explicit reasons are not requested that they implicitly exist in the form of unobservable and unspoken utterances called mental states. Sellars' thought experiment asks us to consider the possibility of a predictive strategy for behavior reliant on a mental state attribution heuristic. In Chapter 3 we will explore "Jones's Problem" which is the idea that attribution heuristics *can* run aground when we factor in human cognitive diversity. Sellars was not interested in explaining human cognitive diversity, though. Furthermore, Sellars intended neither for this strategy to entail; (a) an explanatory model nor be asserted as; (b) a quasi-scientific theory, as others later formulated from his work. He merely meant to overturn the Cartesian assumption of noninferential mental state access. From this point forward, though, the two crucial elements, explanatory modeling and quasi-scientific theorizing, which came to dominate the folk psychology literature were *ad hoc ex post facto*.

The years following Ryle's *The Concept of Mind* (1949) and Sellars' "Empiricism and the Philosophy of Mind" (1956) saw the ascendancy of semantic problems of folk psychology and the rise of explanatory models and the quasi-scientific theory. Semantic

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<sup>12</sup> An object language is defined as a semantically and syntactically system of symbols and an ordered metalanguage is a higher-level language used to functionally determine the semantics and syntax of the object language.



problems in the philosophy of mind were certainly nothing new. The traditional semantic problem goes something like this: How is it possible for me to predicate, or simply be able to describe, the psychological qualities of mental states of other people's minds from my own singular case? Typically, when we talk about psychological qualities we are referring to the paradigmatic cases of "belief" and "desire". The traditional semantic problem is most famously addressed by Ludwig Wittgenstein in the *Philosophical Investigations* (1953/2001). Wittgenstein asks us to imagine a community in which everyone has a box and inside this box is something called a *beetle*. He says, "No one can look into anyone else's box, and everyone says he knows what a beetle is only by looking at *his* beetle" (§293). Since the beetle and its predicates (or qualities) cannot be accessed by anyone but an individual singularly, to talk about its predicates (or qualities) in a public language is, on Wittgenstein's argument, absurd. How can we establish relations of meaning then? Solutions were developed around folk psychology. The semantic problem of folk psychology was taken up variously by David Donaldson (1963), Paul Churchland (1970), and David Lewis (1972). The common thread among these three is an explicit *theory status* for folk psychology and insistence upon a *logical-causal framework*. By logical-causal framework, I mean that these philosophers insisted upon analyzing the constituent parts of folk psychology in terms of causal relations between mental states. Each of the proposals is certainly nuanced, but I shall develop Churchland's (1970) thesis in the most detail as an exemplary case.

Churchland's folk psychology thesis proceeds under the "covering law" or deductive-nomological model *qua* Karl Popper's *Logik der Forschung* (*The Logic of Scientific Discovery*) (1934/1959) and Hempel and Oppenheim's (1948) "Studies in the Logic of

Explanation". The deductive-nomological model, or D-N model, provides the sciences<sup>13</sup> with a purely deductive account of explanation and prediction *qua* causality in an attempt to overcome Hume's causal chasm. 18th C. philosopher David Hume (1711-1776) rejected innate ideas and suggested that all our knowledge of the world comes from experience. Furthermore, he applied this standard carefully to the concept of cause and effect thereby leaving our notions of cause and effect bereft of the important concept of *necessity*. In an *Enquiry on Human Understanding* (1748/1955) Hume writes that although we can, in our experience, perceive two events, *A* and *B*, in conjunction, it would be an error to suggest that we may apply some principle of a *necessary connection*. In short, one can read Hume as rejecting causal necessity as a metaphysical concept beyond the reach of the human intellect. Subsequent philosophers attempted to overcome Hume's skepticism about necessary causal connections, or what I call Hume's chasm, because an empiricist account of scientific knowledge would be incomplete without causal necessity. The D-N model is one such attempt. 20th C. philosopher of science Karl Popper writes that his relation to Hume was connecting a cause *A* with an effect *B* with the addition of a *universal covering law* (Popper, 1934/1959). A universal covering law is a logical conditional statement with *initial conditions* as the antecedent of the conditional and an *explanandum* as the consequent. So, when the initial conditions are met, the explanandum will necessarily follow via *modus ponens*.

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<sup>13</sup> More specifically, it was designed with physics in mind, but physics was the paradigm science for philosophers of science until later in the 20th C.

Now, for the QS theory of folk psychology, Churchland (1970) supposes that the D-N model is a mostly successful conceptual framework for the purpose of explaining and predicting mental state and behavior relations.<sup>14</sup>

In the normal case, if one says, ‘X A-ed because he wanted Ø,’ one implies that (1) X wanted Ø, and (2) X believed (judged, saw) that A-ing was, under the circumstances, a means for him to achieve Ø, an action which would achieve Ø or contribute to his achievement of Ø. One's explanatory statement would normally be defeated if either of these were shown to be false (p. 216).

In this case, X represents an agent, A represents some action or behavior, and Ø represents something which X wanted. When Churchland refers to an “explanatory statement”, he means the universal covering law of a D-N model. Churchland provides a series of possible criticisms of a D-N strategy for explaining and predicting intentional action. He produces six such possible challenges to the ability of a covering law to predict and explain a particular agent’s behavior. He supposes that to overcome contingencies inherent in human thinking and behavior, we ought to add some logical conjunctions to the universal covering law. For instance, suppose that our agent, X, has a desire, Ø, to interact with an individual at a noisy party, but that X is incapable of performing some action, A, crooking ones finger in a “come hither” motion. In this case, a physical human limitation could limit the universality of the covering law and restrict its ability to explain and predict behavior from mental ascriptions. Or suppose an opposite case, where X cannot seem to stop crooking her finger. All the party-goers would be convinced that her desire is to communicate with whoever’s direction her finger happens to be crooking in. Based

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<sup>14</sup> He would later recant (Churchland, 1981; 1984; Churchland & Haldane, 1988) suggesting that mental phenomena are not constituted by linguistic propositions or proto-propositions. Rather they are non-linguistic. He rejected the D-N model both as an action explanation for human behavior and generally its use in the scientific method.

upon this kind of example, Churchland argues that his qualifications must be taken under consideration when constructing nomic connections in a universal covering law. For this reason, he sees a folk psychology under the D-N model as establishing “law sketches” since our models must be filled with *ceteris paribus* clauses.<sup>15</sup> For the reasons given, Churchland still finds a “Person-Theory of Humans” as an acceptable theory based on his conceptual analysis, but only if one takes into consideration a broader class of factors. He writes,

The particular view of action-explanations being defended is but one aspect of the more general view that the common-sense conceptual framework in terms of which we conceive ourselves, qua persons, has all the relevant structural and logical features of those lesser conceptual frameworks we call scientific theories (for example, molecular theory), (Churchland, 1970, p. 225).

This QS theory of folk psychology putatively solves the semantic problem of mental states. If we accept Churchland’s account of folk psychology as a theory which binds the meaning of psychological predicates (or qualities) of mental states in a system of law-like relations with behavioral explananda, then we have solved the semantic problem of mental states by universalization and law sketches. Hume’s Lockean empiricism led him to skepticism about the relation of causal necessity between events  $A$  and  $B$  and was conceptually overcome by the D-N model. Wittgenstein’s inherited Cartesian solipsism about the qualities of other minds was overcome by applying the D-N model to a folk psychological framework. Recall that Sellars originally produced folk psychology merely as a useful heuristic for understanding overt human behavior, but, by the 1970s, it had been afforded its own ontological status both literally and figuratively in the minds of philosophers of mind. To

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<sup>15</sup> Meaning “all things equal” in reference to initial conditions – *ceteris paribus* clauses are used to bolster the predictive and explanatory success of a probabilistic model by being able to blame faulty initial conditions if the model is found to be inaccurate. Churchland states that they are used to fill “gaps and fuzzy areas in our knowledge of nomic connections” (p. 222).

understand human mentation and human behavior was to conceptualize the functions of our minds as guided by universal nomic structures.

At this point, we have considered the semantic and epistemic dimensions of the folk psychological problem space. Folk psychology, as a fact to be explained, emerged most prominently in the work of Sellars and underwent a series of changes throughout the latter quarter of the 20th C. For instance, we can see Churchland's addition (a mutation of the theory) and the implications of this addition on future theorizing. In the next section, I explore the ontological dimension of folk psychology, or in what sense so the objects mentioned in a given theory of mind exist in a similar historical etiological strategy as in the previous section.

### **Section 1.3: Minds and Bodies**

Ontological problems inherent in folk psychology were being taken up by a number of philosophers of mind alongside semantic/epistemic problems. Relating the mind and the body has been of serious Western philosophical concern since the selective popularization of the "thinking-thing-Descartes" argument for mind/body dualism wherein the body exists in a spatial realm while the mind does not occupy space yet interacts with the body. The history of this problem from its inception to the 20th C. could fill several volumes. My brief overview will begin with Gilbert Ryle's *The Concept of Mind* (1949) to direct the discussion for this section. In what follows, we will again trace the history of folk psychology and its evolution in philosophical thinking. Furthermore, we will see how its implications are relevant to understanding how we conceptualize what it means to be human. Ryle's contribution to the 20th C. philosophy of mind is a clever and convincing argument against Cartesian dualism, or, as he calls it, the Official Doctrine. Ryle argues that our

conceptualization of mental processes as something logically distinct from physical or bodily processes is naught more than what he calls, in befitting ordinary-language style, a “category error”. The Cartesian supposition that acts of the body are caused by acts of the mind is to hold the Cartesian dogma of the “ghost in the machine”. Ryle is generally credited with a weak, or soft, behaviorist program within the philosophy of mind but such a claim misses the wholeness of Ryle’s work (cf. in particular Fodor, 1968). Ryle’s position is something like a version of analytic behaviorism, but Ryle did not propose an extreme version which jettisoned mental states entirely. Much of analytic behaviorism putatively holds that semantic clarity begets ontological progress.<sup>16</sup> I find that both semantics and ontology become muddied when one is privileged over the other. Furthermore, there is an explicit privileging of body/behavior over the mind in a behaviorist program and this inversion of the problem of the Official Doctrine does no philosophical work. Ryle should rightfully be credited with tactically erasing Cartesian dualism and allowing for the development of physicalistic mind/body monisms which neither privilege mind nor body. Such monisms were the psychoneural reductive theories.

Psychoneural reductionism has been called “central-state identity theory”, “mind-brain identity theory”, or just “identity theory”. I intend to focus my attention on the identity theory as it was put forth by Australian philosopher of mind, science, religion, and politics John Jamieson Carswell Smart (1920-2012). Identity theories evolved in separate niches of a common ancestor; two of its developers, J.J.C. Smart and Ullin Place (1924-2000), were students of Gilbert Ryle. The other most cited theorist is Vienna Circle member and student of Moritz Schlick, Herbert Feigl (1902-1988). In what follows, I develop Smart’s version of

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<sup>16</sup> Much ado to White, 1951 for the terms “ontological progress” and “semantic clarity”.

the identity theory as the most representative of the identity theories. As we will see, Smart's identity theory adopts a universalized view of the mind-brain.

J.J.C. Smart put forth his version of the identity theory in his 1959 paper "Sensations and Brain Processes". Smart admits that his thesis is an addition to those arguments already put forth by Place and Feigl. He asserts that a sensation – which he eventually equivocates with states of consciousness – is strictly identical to a brain state. As such, any folk psychological posit is strictly identical to a brain state. Smart relies on the enlarging explanatory power of the physico-chemical mechanistic framework within science and an appeal to Occam's Razor to advance his argument. Smart says that one of the last remaining cases which putatively stand outside the scientific worldview is that of human consciousness. While some grant a correlational relationship between consciousness and brain processes, Smart finds this unsatisfactory as it presupposes that sensations serve as something "over and above" brain processes. By reason of analogy, Smart asks readers to consider synonymy between "nations" and "citizens"; "lightning" and "electrical discharge"; and the "Morning Star" and the "Evening Star". In Fregean terms, all of the paired terms share a common *reference* (or the object denoted by the term) but have two *senses* (or the way the term refers to the object). Smart's identity theory assumes that for any particular *type* of mental phenomena there is a strict identity relationship to a particular *type* of brain process. This one to one relationship between, for instance, pain, and a particular brain state, for instance, 0569C, is to universalize pain into one concept to one particular way in which a brain is. There are at least two glaring problems in Smart's statement of the identity theory. Smart, as Polger (2011) points out, admits that his identity theory is "a metaphysical theory, not a semantic proposal or an empirical hypothesis" and, furthermore, "Metaphysical

theories of the nature of mind do not make competing empirical predictions; so they should be evaluated by their own theoretical virtues, e.g., simplicity and parsimony” (p. 2). One error of “type-type” identity theory is unresponsiveness to empirical data. Another error, on my account, is that type-type identity theories universalize both the mental and physical in an identity relationship and diminish the possibility of individual neurocognitive variation. The fundamental error of type-type identity theories, according to some philosophers, was of another kind. As we will see in the next paragraph, type-type identity theory was challenged by a number of philosophers for its inability to be a general theory of cognition.

Criticism of the type-type identity theory came from a series of papers in the 1960s by Harvard philosopher of mind, language, epistemology, and science Hilary Putnam. Putnam (1960, 1967) advanced an argument which held that the identity theory failed to account for identical mental states instantiated by nonidentical brain states or nonidentical physical media, also called *multiple realizability*. The backstory for this criticism was an insistence upon a theory of cognition which could be universalized; philosophers of mind wanted to define cognition as an abstract logical possibility devoid of any particular content. On their view, identity theory was imbued with a specifically human parochialism unbefitting good philosophical conceptual reasoning. Multiple realizability depends upon getting clear about what level of granularity is being invoked in our examples. Pain is generally a paradigm case for these examples because it is at such a level of generality that we know two people can be in that state. Suppose that we hook up a person, Jones, to an fMRI machine to scan his brain whilst pinching his arm. Presumably, on a number of accounts, we would find a brain state of C-fiber firings in a particular pattern. Suppose further that we perform the same experiment with another individual, Smith. Would Jones and Smith have the same



brain state given that they were both in the same mental state? The suggestion is that pain can be realized multiple ways in different brains. Beyond this suggestion, suppose we consider the mental states of beings from a planet unlike our own. Their biological makeup may not consist of neurons but, who nevertheless still have mental states. Suppose that we determine a technology to test their mechanism for thought and perform the same experiment we performed on Jones and Smith. Their mental state of pain cannot be explained by C-fiber firings, as can ours. We say, then, that identical mental states can be realized (or had) in a multitude of different physical conditions; thus, mental states are not identical to brain states because they can be multiply realizable.

The overarching point, throughout the epistemological, semantic, and ontological history of folk psychology is its relative independence from empirical testing as a set of concepts. As an *a priori* posit of the human mental experience by analytic philosophers of mind, folk psychology has endured quite a lengthy process of development and variation as we have seen in the preceding sections. Both identity theory and philosophical functionalism took folk psychological states at “face value” and incorporated them into their theoretical framework. The isolation of folk psychology from the sciences cannot lead to any productive or testable theories on my account. In the next section, we will see how folk psychology has been imported into the Cognitive Sciences and how it has fared.

#### **Section 1.4: Minds and Methods**

As we saw in the previous two sections, both of the given ontological solutions (the identity theory and functionalism) subsume a folk psychological framework insofar as mental state terms are taken at face value – either folk psychology reduces to brain states (identity theory) or folk psychology is instantiated as software in some physical hardware

(functionalism). As evidenced above, the chasm between identity theory and functionalism might not be so wide. In addition, there are even other possible views on mind-body ontology. If we turn to the Cognitive Sciences to determine the life of folk psychology, it is quite prevalent and vibrant. Before proceeding, though, I should like to make a few points on the cognitive sciences. There is an often mistaken assumption that “cognitive science” picks out a single entity or single discipline in itself, but this is a mistake. The constitutive anchoring disciplines of the cognitive sciences are: anthropology, artificial intelligence, education, linguistics, neuroscience, philosophy, and psychology (Gardner, 1985; Bechtel & Graham, 1998). While this list captures most of the interdisciplinary work, it is certainly not exhaustive. The late 20th and early 21<sup>st</sup> centuries have seen a proliferation of new disciplines at the boundaries of the anchoring disciplines, often called “bridge disciplines”. Some example bridge disciplines are behavioral economics, cultural neuroscience, embodied cognitive science, cognitive neuroscience, cognitive sociology, cognitive linguistics, neurosociology, and so on (Gray Hardcastle, 1994). For instance, consider behavioral economics as a paradigm case. Behavioral economics is a bridge discipline between cognitive psychology and classical economics. Traditional neo-classical economists developed the concept of *Homo economicus* to define humans as rational agents whose interests were to maximize utility. From this assumption, models were constructed and used to predict and explain economic behavior. In the 1960s and 70s, the rational-choice model was being challenged by findings on human decision-making under risk and uncertainty in cognitive psychology. The landmark paper at the height of the cognitive revolution which undermined the overly rationalistic treatment of cognition was Kahneman and Tversky’s (1979) “Prospect Theory: An analysis of decision under risk.” This paper has been integral in the

bridge discipline of behavioral economics. Both neoclassical economics and behavioral economics continue to describe and explain human economic behavior.

Frankly, I find it a mistaken project to even seek to construct a uniform discipline called “cognitive science” wherein each of the six disciplines collapses one into the other.<sup>17</sup> Instead, the cognitive sciences are a series of distinct disciplines with distinct methodologies, distinct foundations, and distinct evidence. Navigating the torrent of theoretical foundations in the Cognitive Sciences to find an implicit commitment to folk psychology is a difficult process. Many within the cognitive sciences have agreed, at least, on the basic intent of the enterprise. For instance, neuroscientists Lara and Cervantes-Perez (1993) provide their view on the cognitive sciences. They write,

Although everybody keeps in perspective that the main goal of Cognitive Science is to understand the causes of intelligent behavior, different fields seek different kinds of causes (e.g., mechanical, linguistic, or mental) and, thus, use different research methodologies (p. 533).

The important point is that there is a unity of the cognitive sciences in a single problem space, but not a uniformity of cognitive sciences in solutions and methods. The distinction between unity and uniformity is that the former entails a common purpose at the most general level while the latter implies a collapsing the methods and foundations of one science into the other. The common factor which I should like to focus upon within the domain of the Cognitive Sciences is the ontogeny of folk psychology.

If, as I have previously stated, the philosophy of mind offers the Cognitive Sciences the metaphysical preconditions to perform their work productively, then one would presume that the conceptual work of folk psychology would translate into the empirical sciences. The

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<sup>17</sup> The argument (or suggestion) the cognitive sciences should collapse into one another has been made by Gardner (1985).

preferred outcome, recall, is to have concepts which are conceptually disciplined and empirically constrained. As we will see first, it is not the case that there is a massive program of translation from philosophy of mind to Cognitive Sciences of any sort at this point, but this is no reason to suppose that such a translation is neither possible nor desirable. There is some hope of interaction and conceptual discipline as we will see later in the work of Alison Gopnik and Andrew Meltzoff (1997).

Thus far I have suggested that the unconstrained empiricism characteristic of the Cognitive Sciences is problematic. Unfortunately the claim of unconstrained empiricism levies the charge of incompetence or unscrupulousness upon researchers in the cognitive sciences. I realize that this charge may be rejected by researchers in the cognitive sciences, but one must recognize that my criticisms are levied at problematic individuals rather than a sweeping claim about cognitive scientists as a species. I am suggesting that while particular researchers can be quite right in their diagnoses of a particular conceptual problem, they can also be quite wrong in their foundational assumptions. In what follows, I will first analyze two cases of researchers in the Cognitive Sciences who exemplify responsible conceptual thinking. Second, I will consider cases where researchers' commitments were conceptually undisciplined and outright reckless.

A first case is neuroscientist Mark Baxter (2012) at the Mount Sinai School of Medicine. Baxter challenged a common assumption in the brain and behavioral sciences when he suggested the phenomena of memory and perception may not be distinct cognitive processes (2012). As he states, there are two common understandings in neuroscience regarding the relationship between information processing in the perceptual system and the memory system. Both agree that the cortical areas responsible are within the medial temporal

lobes (MTL) and that this includes both the hippocampus and the perirhinal cortex. But, as Baxter outlines, it is not the anatomical map which is in question, but rather the functional map. On the one hand, the “memory system” view suggests that memory is functionally encapsulated as he says, “that MTL structures form a dedicated neural system ‘for the formation of memory and for the maintenance of memory for a period of time after learning’...with perceptual processes occurring outside of the MTL” (p. 8). On the other hand, the “representational-hierarchical” view incorporates the perceptual system into the memory system as it places the perirhinal cortex as highly functional in one half of the streams of the perceptual system; the one which determines “what” a person is viewing.<sup>18</sup> Baxter, in commenting on the findings in an article in *ScienceNews* (2012), said, “‘The idea that perception and memory are different is folk psychology.’ This new study and others like it show that the brain’s memory system and perception system may be one and the same” (p. 11). Baxter’s comments suggest a refreshing level of awareness of problems that may inhere in unchecked cognitive concepts such as “memory” and “perception”.

Similarly, consider University of California, San Diego neuroscientist V.S. Ramachandran’s suggestion that *the self* is a concept which we have too loosely assumed to refer to one unified entity. Following the above discussion of the distinction between the “what” and “how” pathways in visual perception, Ramachandran cites a case by Dr. David Milner (Milner, 1995 as cited in Ramachandran, 1998), a neuropsychologist, in which a patient, Diane (DF), had her “what” and “how” pathways dissociated in an accident. The resulting phenomenon was Diane’s ability to determine the placement of an object in space, but to be phenomenologically blind as to what the object was. This dissociation, as well as

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<sup>18</sup> The other is the “how” pathway and orients an object in space. This distinction is called the “two-streams” hypothesis (cf. Goodale & Milner, 1992).

numerous other phenomena, led Ramachandran to the idea that the self is actually an illusion in consciousness. He writes,

The most obvious fact about existence is your sense of being a single, unified self “in charge” of your destiny; so obvious, in fact, that you rarely pause to think about it. And yet Dr. Aglioti’s experiment and observations of patients like DF suggest that there is in fact another being inside you that goes about his or her business without your knowledge and awareness. And as it turns out, there is not just one such zombie but a multitude of them inhabiting your brain. If so, your concept of a single “I” or ‘Self’ inhabiting your brain may be simply an illusion—albeit one that allows you to organize your life more efficiently, gives you a sense of purpose and helps you interact with others (pp. 83-84).

The unity of self as a concept is an extant historical philosophical problem. Its prevalence is not simply a result of theories of the self as given by philosophers, but also can be found in the folk psychology which we have been analyzing. U.T. Place (1996) calls the assumption of a singular willing self *the need for a scapegoat*. He says, “The theory of causation of behavior embedded within folk psychology is distorted by the need...to pin the blame on a particular individual when anything goes wrong” (p. 268). Ramachandran’s research suggests that he is aware of the conceptual implications of “the self” and how it manifested both in the brain as a neurological event and in the social realm.

A possible instance of unconstrained empiricism which has garnered attention from both neuroscientists and philosophers is some recent research in cognitive neuroscience. Bennett and Hacker (2003) provocatively claim that researchers in cognitive neuroscience have erred in their application of psychological predicates to neural processes and commit what they call “the mereological fallacy”. The mereological fallacy means attributing to parts of a being those things which are properties of the whole. In a review, Patterson (2003) writes that,

What interests Bennett and Hacker about the Cartesian replacement of Aristotelian thought is the extent to which contemporary neuroscientists have failed to go far enough in their rejection of Cartesianism, thereby threatening the integrity of their scientific endeavors (Patterson, 2003).

Furthermore, Patterson summates Bennett and Hacker's (2003) criticisms of empirically confused neuroscientists,

They argue that for some neuroscientists, the brain does all manner of things: it believes (Crick); interprets (Edelman); knows (Blakemore); poses questions to itself (Young); makes decisions (Damasio); contains symbols (Gregory) and represents information (Marr). Implicit in these assertions is a philosophical mistake, insofar as it unreasonably inflates the conception of the 'brain' by assigning to it powers and activities that are normally reserved for sentient beings (Patterson, 2003).

Bennett and Hacker's criticism of the importation of the worldview of an inherited "thinking-thing-Descartes" into neuroscience is reminiscent of the kind of criticism which Ryle (1949) made of the "Official Doctrine". In lieu of suggesting that neuroscience commits the mereological fallacy, Bennett and Hacker might channel Gilbert Ryle and suggest neuroscientists were making a "category error" by conflating beings and brains. Bennett and Hacker's (2003) overview of several researchers in cognitive neuroscience and their commitment to collapsing different causal structures based on observation and questionable theoretical frameworks evidences the kind of unconstrained empiricism I have previously mentioned. In what follows, I explore a productive example of a researcher empirically studying folk psychology and taking conceptual problems under serious consideration.

An example of a productive and thoughtful relationship between the philosophy of mind and the Cognitive Sciences is from University of California, Berkeley developmental psychologist Alison Gopnik. Gopnik specifically works on the development of folk psychology as psychological concept. She is most notable for her development of the

“theory-theory” of folk psychology with fellow psychologist Andrew Meltzoff (1997). For Gopnik, the theory-theory serves as a plausible theory of child cognitive development somewhere between *psychological nativism* and *psychological empiricism*. I will cover these two concepts in brief and resume my discussion of Gopnik shortly.

Gopnik and Meltzoff’s theory-theory of folk psychology is the closest species to the QS theory of folk psychology detailed in the previous sections. Gopnik and Meltzoff carefully define their position in contradistinction to psychological nativist modularists<sup>19</sup> like Pinker (1994) and also from empirical generalizations from psychological empiricists<sup>20</sup>, e.g., connectionists<sup>21</sup> like Terry Sejnowski (Sejnowski & Rosenberg, 1987). Whereas, for the modularist, the psychological givens cannot be changed with experience, the theory-theory allows for adjustments to the theory provided that alternative cases violate the theory. Similarly, the theory-theory of folk psychology is superior to the empirical generalizations of the psychological empiricist for they are limited simply to experience and cannot have the predictive and explanatory power of an innate theory. For Gopnik and Meltzoff, a theory must consist of four necessary features: abstractness, coherence, the involvement of appeals to causality, and ontological commitments. The particular details are unimportant, but, rather, it is the self-imposed moderation between modularity and empiricism which is the most telling. Gopnik, as it turns out, is dually appointed at the University of California,

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<sup>19</sup> I explicate nativism and modularism in Chapter 2. For the purpose of this reference, nativist modularism is a theoretical position within the cognitive sciences which holds that human minds have at least a moderate amount of innate (or inborn) structure.

<sup>20</sup> As with nativism, more will be said about empiricism in Chapter 2. Empiricism is a theoretical position within the cognitive sciences which holds that human minds do not have the kind of innate mental structure that the nativist supposes.

<sup>21</sup> Connectionism is a set of approaches and theories in the cognitive sciences which suppose that mental phenomena are emergent processes from the interaction of simple units. Connectionism, as I will illustrate in the next chapter, is a contemporary instance of empiricism.



Berkeley in both the psychology and philosophy departments. It seems her work serves to show the fruitfulness of interaction between philosophers and psychologists.

Other worthy examples of this emphasis on conceptual discipline and empirical restraint are Griffiths (2002) who shows that the concepts of emotion in traditional psychology are false. He argues that we should dissociate it into multiple kinds of concepts. A similar analysis on memory by Schacter (1996) results in a similar conclusion. A growing interaction between those in the cognitive sciences doing empirical work and philosophers insistent upon clarity and accuracy about conceptual categories can underlie a successful research program which avoids the potential problems in undisciplined conceptualizing, unrestrained empiricism, and so on. Such positive research programs are open to reinterpretation and both internal and external critique. Before we consider future research strategies, let us consider another set of concepts which has seen a litany of conceptual and empirical clashing recently, namely the tension between the theoretical frameworks of nativism and empiricism in the architecture of mind (Prinz, 2012).

## Chapter Two

### Of Modules and Not-Modules

In Chapter 1 we saw the ontogeny of folk psychology as a meaningful concept in both the philosophy of mind and the Cognitive Sciences. After meaningful interaction across the philosophy of mind and empirical cognitive science gap, the resultant concept of folk psychology was both conceptually disciplined and empirically constrained, two desiderata for scientific progress I have proposed. In other words, I showed how positive interaction between philosophers of mind and researchers in the Cognitive Sciences bred a more fit concept of folk psychology. In section one of Chapter 2, I introduce a way of thinking about concepts like folk psychology, which could be shared between the philosophy of mind and the Cognitive Sciences and in some cases is already shared. I call this way of thinking *inherited ontologies*. In what follows, I outline inherited ontologies as a conceptual analysis apparatus and defend why I think it is useful for philosophers of mind. Philosophers of mind working with the Cognitive Sciences in a positive way and focusing their attention on developing an applied philosophy of science are (and should) making what I call the *speculative psychology turn*.

#### Section 2.1: Inherited Ontologies and the Biological Analogy

In his book, *The Darwin Economy* (2011) Cornell University economist Robert Frank suggests that Darwin may one day perhaps be considered the father of modern economics in lieu of the traditional standard-bearer Adam Smith. Frank argues that human economic extravagance brought on by unnecessary competition with one another was a defining reason for the economic meltdown of the early 21st C. Frank writes,

Darwin's view of the competitive process was fundamentally different. His observations persuaded him that the interests of individual animals were often profoundly in conflict with the broader interests of their own species. In time, I predict, the invisible hand will come to be seen as a special case of Darwin's more general theory (p. 17).

Frank compares the bull elk to U.S. consumers. Bull elk trade-off agility in wooded areas for sizable antlers. On the one hand, the bull elk has magnificently large antlers for competing with other bull elk and attracting mates, yet on the other hand, the size of his antlers leave him helpless at the jaws of hungry wolves in densely treed forests. Frank says this kind of evolutionary arms race can be devastating. U.S. consumers all too often engage in evolutionary arms races as they purchase larger and larger homes and other such extravagance at the expense of the well-being of their neighbors and the global commons. Frank says reasonable controls on these arms races – a conflict between an individual and the entire species – would, if we could artificially select in these cases, make for reasonable and sustainable growth for the future. Just as Frank extends the biological analogy to economic markets, I extend the biological analogy to the marketplace of ideas. In what follows, I detail a conceptual apparatus I call *inherited ontologies* and explain the biological analogy in the marketplace of ideas. Ontology, in traditional philosophy, refers to the study of what there is and, perhaps more importantly, how what there is comes into being. Inheritance, within evolutionary biology, is the heritability of traits from a species to its

progeny with the probability of variation. I use the idea of an ontology as a structured set of knowledge consisting of a relationship between theories, hypotheses, observations, and some perceptual or intuitional origin.<sup>22</sup> An ontology, on my view, is inherited just as genotypic and phenotypic traits are heritable. Much as the probability of variation in biological evolution is far below even chance levels, we can say that the same is true for the variability within any ontology – insofar as science and other knowledge production processes tend to be conservative.<sup>23</sup> Furthermore, as we understand more about epigenetics, we also know that inherited traits are subject to environmental factors. Following Muntersbjorn (2003), I argue that inherited ontologies are cultivated over time within a mutually reticulated system of socio-historical factors and cognitive-biological factors. Inherited ontologies, then, are successful based upon their ability to replicate themselves in a particular niche. The conditions for survival are determined, as mentioned before, both internally and externally.

Returning to Frank's analogy and *The Darwin Economy* (2011), I share the worry that unconstrained entities can grow beyond their means and do lasting damage to the species in its entirety. Frank's main opponent in his book is the economic libertarian, who sees unrestrained competition as an intrinsic good. He uses economic models and evidence to support his claims about a more communitarian economic outlook. My opponent is exactly whom Brook (2009) outlines. He claims that most researchers in the Cognitive Sciences have a general view which distills into something like the following,

Philosophers mounted some interesting speculations about the mind in times past but we are now in a position where we can get out of the armchair and

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<sup>22</sup> Information theory uses the term “ontology” in a very similar way. Cf. Gruber, 1993. I do not make explicit reference to this idea of ontology for I do not share the computational/informatics approach and defer to evolutionary biology as a framework for understanding the growth, change, accumulation, and replication of knowledge.

<sup>23</sup> Assumption made and owned.

do real science on these things. Philosophy, imaginative and entertaining though it can be, has been relegated to the dustbin of history. There is still something to logic and maybe ethics but the rest of philosophy has been superceded by science (p. 219).

As Brook and I agree, philosophy (philosophy of mind, in particular) is more than armchair science. Good philosophers of mind are indeed logicians insofar as they clarify concepts, analyze evidential relations, and make implicit conclusions explicit. Good philosophers of mind are also ethicists as they are concerned with the social and political implications of their views and the views of others. I use inherited ontologies in my analysis as a way of talking about ideas as malleable entities that are passed on in modified form from one generation to the next. Frank's biological analogy offers us a way of understanding how constraints on malleability can be beneficial provided that they are nonarbitrary.

Let us return our thoughts to Chapter 1 and the development of folk psychology. I traced the historical etiology of folk psychology implicitly using the concept of inherited ontology. As we saw, folk psychology was in some instances conceptually undisciplined and empirically unconstrained. Recall its origins in Sellars' "Empiricism and the Philosophy of Mind" (1956) and its mutations through the quasi-scientific theory period. Retrospectively, and in an inherited ontologies vocabulary, folk psychology's mutation into a theory of how humans think based upon the deductive-nomological model was an overstep by the philosophers of the time. Prior to Churchland's (1970) admission that universal covering laws needed to be downgraded to "law sketches", it was presumed that observations about human behavior could be deduced from putative universal laws of mental-behavioral relations. Assuming universal laws in this way is conceptually undisciplined, as Churchland demonstrates in his counter-examples. Functionalism's unreflective incorporation of folk psychology may be another example of conceptual undiscipline. I will explain why

functionalism as a response to the central-state identity theory was conceptually undisciplined in more detail in Chapter 3. If folk psychology were not so clumsily defined in so many domains, it might have faced extinction. Folk psychology might be more akin to a robust fast-mutating virus than the extinct tree-tangled bull elk precisely because it is so vague and can mean many things to many people. I continue this trend of discussion of inherited ontologies by discussing a similar concept which appears both in the philosophy of mind literature and in the literature of the Cognitive Sciences, the structure, or architecture, of the human mind. In my discussion of folk psychology in Section 4 of Chapter 1, the inherited ontologies of nativism and empiricism were mentioned. I further elaborate on those here explicitly using the terminology of inherited ontologies.

## **Section 2.2: Minds and Nature**

Nativism, in its recent philosophical instantiations, is associated most often with linguist Noam Chomsky (1980; 1988) and philosopher Jerry Fodor (1983). Chomsky (1959) was heavily involved in what has become known as the *linguistic wars* among those espousing a behaviorist theory of language (verbal behavior) and those espousing a mental representationalist account of language. Chomsky's (1980) most important contribution to nativism is the *poverty of the stimulus* (POS) argument. The POS argument states that some psychological phenomena (knowledge of grammar, in Chomsky's case) is too rich or too complex to be learned from experience and, thus, must be innate. But what exactly must be innate? Fodor, in his book *The Modularity of Mind* (1983), presented the following four goals: (1) develop a *modularity thesis* as a specific instantiation of the faculty psychology hypothesis, (2) specify properties of a modular system, (3) provide examples of some mental processes which are likely to be modular, and (4) defend and disentangle the modularity thesis from

the hypothesis of *epistemic boundedness*, or the idea that human beings are limited in what they can know based upon internal constraints.

I have previously alluded to modularity's foundations in philosophical rationalism of the early modern period, but its more recent developments are of more interest for understanding its conceptual mutations and empirical implications. As the dominant model in the Cognitive Sciences – particularly neuropsychology (Pinker, 1991; Bellugi, Wang, & Jernigan, 1994), linguistics (Jackendoff, 1983), cognitive psychology (Gardner, 1983), artificial intelligence (Bryson & Stein, 2000), and some branches of the neurosciences (Marr, 1982, and cf. Bryson, 2005) – modularity came to ascendancy with the theoretical framework of cognitivism and the computational theory of mind. The rise of cognitivism in psychology has been termed the *cognitive revolution* (Gardner, 1985). The computational theory of mind refers to the conjectures of researchers in psychology, computer science, and artificial intelligence in the 1950s who claimed that the human mind could be understood as a formal symbol manipulating machine (McCulloch & Pitts, 1943; von Neumann, 1951; Newell, Shaw, & Simon, 1958). Alan Turing, Warren McCulloch, Norbert Wiener, and John von Neumann, inter alia, expanded the theory that reasoning was a form of computation. This proposal was by no means new as it was Hobbes (1651/1968) who first proposed that reasoning was mechanistic, or a series of calculations. Cognitivism is generally understood as a reaction to psychological behaviorism and refers to those researchers in the Cognitive Sciences who reincorporated mental constructs into their theoretical posits.

What is meant by a “cognitive module” is different across the cognitive sciences and most deviate from Fodor's original proposition; furthermore, empirical accounts differ as to what is and is not modular (McClamrock, 2003). As Prinz (2006) has cleverly pointed out,

“[Fodor’s] actual view is that the mind divides into systems some of which are modular others of which are not. The book would have been more aptly, if less provocatively, called *The Modularity of Low-Level Peripheral Systems*” (p. 22). That Fodor’s modules are limited within human neural architecture will be important in my later discussion of evolutionary psychology. Fodor’s (1983) modularity hypothesis is that modules have nine necessary conditions and I borrow Prinz’s (2006) short description of each of them,

- (1) Localized: modules are realized in dedicated neural architecture
- (2) Subject to characteristic breakdowns: modules can be selectively impaired
- (3) Mandatory: modules operate in an automatic way
- (4) Fast: modules generate outputs quickly
- (5) Shallow: modules have relatively simple outputs (e.g., not judgments)
- (6) Ontogenetically determined: modules develop in characteristic pace and sequence
- (7) Domain specific: modules cope with a restricted class of inputs
- (8) Inaccessible: higher levels of processing have limited access to the representations within a module
- (9) Informationally encapsulated: modules cannot be guided by information at higher levels of processing (p. 22).

Fodor (1983) states that the modules he proposes are computational in their operation before outlining any of their particular characteristics. Fodor’s modularity thesis, according to Prinz, falls short on a number of fronts when we begin to incorporate findings from the empirical sciences into the set of concepts presented here. Fodorian modularity (in its original instantiation) commits the error of being an undisciplined concept since it is admittedly unresponsive to empirical findings.<sup>24</sup> Before delving into how we can bring modularity of mind into contact with a constrained empiricism, I should like to first

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<sup>24</sup> Cf. Fodor, 1983, p. 1.



introduce what an empirical science theoretical framework would look like which takes into account some semblance of a modularity thesis. Such theoretical frameworks in the Cognitive Sciences are psychological nativism and domain-specificity. I will first introduce the strong Santa Barbara school evolutionary psychology which posits *massive modularity* and then introduce the weaker theoretical position of domain specificity.

I have referred to strong nativism as the Santa Barbara school in honor of University of California, Santa Barbara professors Leda Cosmides and John Tooby. Cosmides is a cognitive psychologist and Tooby is an anthropologist. Both Cosmides and Tooby, along with Canadian anthropologist Jerome Barkow, edited the influential volume *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (1992). While Cosmides, Tooby, and Barkow do not represent the field of evolutionary psychology *in toto*, they have been credited with setting forth the foundations of the discipline in *The Adapted Mind* and continually revisiting and defending these foundations. Tooby and Cosmides (2005) present six theoretical principles upon which evolutionary psychology relies,

1. The brain is a computer designed by natural selection to extract information from the environment.
2. Individual human behavior is generated by this evolved computer in response to information it extracts from the environment. Understanding behavior requires articulating the cognitive programs that generate the behavior.
3. The cognitive programs of the human brain are adaptations. They exist because they produced behavior in our ancestors that enabled them to survive and reproduce.
4. The cognitive programs of the human brain may not be adaptive now; they were adaptive in ancestral environments.
5. Natural selection ensures that the brain is composed of many different special purpose programs and not a domain general architecture.
6. Describing the evolved computational architecture of our brains “allows a systematic understanding of cultural and social phenomena” (p. 18).

Evolutionary psychology provides an apt model of an empirical cognitive science which has engaged the modularity hypothesis, even if it has been to its logical extreme. Before explaining what I mean by “logical extreme” I first address the philosophical link to evolutionary psychology. The importation of Fodorian modularity of mind is most evident in theoretical principles 1, 2, and 5. Recall above that I noted Fodor’s (1983) commitment to computationalism as the precondition of any modular hypothesis. Cosmides and Tooby adopt this precondition in their framework for psychological research in both principles 1 and 2. Principle 5 is the explicit adoption of domain-specific modules. I will elaborate more on the idea of domain-specificity as a theoretical framework later, but for now it should simply be understood just as Prinz (2006) introduced Fodor’s (1983) concept of domain-specificity in that, “modules cope with a restricted class of inputs” (p. 18).

Earlier I referenced both Fodor’s view that modularity is restricted to low-level periphery systems in the mind and the idea that Cosmides and Tooby took modularity to its logical extreme. The logical extreme I refer to is extending Fodor’s modularity beyond his established limits of low-level systems to cognition in its entirety. This extension of the modularity thesis is called *massive modularity*.<sup>25</sup> Furthermore, as explicitly evidenced by theoretical principles 3 and 5 above, massive modularity incorporates the thesis that modules are evolved organs and the product of selection pressures. The similarities and differences between Fodorian modularity and massively modular evolutionary psychology has certainly been a point of contention in press (Fodor, 2000; Pinker, 2005). As Samuels (1998) points out, Fodorian modularity requires that modules be informationally encapsulated (see above) whereas evolutionary psychologists do not adopt this requirement.

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<sup>25</sup> Cf. Sperber, 1994.

Aside from strong massively modular views, another example of the Cognitive Sciences operating under the concept of modularity is the basic incorporation of domain-specificity. I have heretofore referred to it as the ability of a cognitive module to deal with a restricted class of inputs. Overall, domain-specificity is a general theoretical position within the cognitive sciences (cognitive development, in particular) which argues that the mind functionally decomposes into category-specific conceptual or perceptual knowledge about specific kinds of information about the world. For example, faces, human and otherwise, may be processed by a specific facial-recognition module. The notion of specific kinds of information about the world is a claim about conceptual information which is much older than any perceptual information input we take in during a lifetime. Domain specificity refers to our evolutionary past (it shares this with evolutionary psychology, but not on the massive scale). The assumption of domain-specific, computational modules rejects the empiricist notion of a general-purpose learning mechanism. Recall from Chapter 1 that Gopnik and Meltzoff supposed that there were multiple theories for multiple kinds of domains. This idea of domain-specificity can be traced to developmental cognitive psychologist Frank Keil.

Keil (1979) first explicitly developed a cognitively operant hierarchy of implicit ontological categories. In short, Keil wished to construct a theory of conceptual knowledge – how do we come to know the objects that constitute our world? For instance, he posited that our knowledge of the world picks out items as the following: EVENT, OBJECT, LIVING THING, ANIMATE, HUMAN, and so on. Keil sought to develop a developmental model of a human-centered conception of what sorts of things there are in the world. According to Caton (1981) there was little psychological literature on the topic of ontological knowledge at the time, so Keil relied heavily on literature from both philosophy

and linguistics. Keil's proposed schema of our ontological knowledge closely tracks a classical view of concepts in philosophy (in that they pick out objects in the world as they are in themselves). There are other kinds of conceptual schemas that Keil could have selected (of course, we are thinking about his options from our present viewpoint and not from his perspective). For instance, the different theories of concepts are the 'prototype' variety (in that they pick out objects based on their degree of similarity or dissimilarity)<sup>26</sup>, or are the theory-theory variety (in that they pick out the functions of objects). Additionally, as some have argued (Machery, 2009) concepts might not singularly pick out natural kinds as we understand them, or they might just be of another kind altogether.<sup>27</sup>

The recent work being done in service of Keil's original observation that our knowledge may be structured such that it maps onto specific parts of the world is being pursued by a number of cognitive anthropologists and philosophers. They suggest humans navigate the world using a set of innate presumptions<sup>28</sup> about the way in which the world is structured and the way in which the world functions (Boyer, 2000; De Cruz and De Smedt, 2007). Boyer and De Cruz and De Smedt have variously referred to these innate presumptions about the way in which the world is structured as *intuitive ontology*. According to De Cruz and De Smedt, intuitive ontologies<sup>29</sup> "describe categories of objects in the world, such as 'person', 'artefact', 'plant', or 'animal'" (De Cruz and De Smedt, 2007, p. 352). They claim these domain-specific innate cognitive categories are the ways in which our human ancestors began the scientific endeavor and, furthermore, that these categories continue to

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<sup>26</sup> See Rosch, 1975.

<sup>27</sup> Some admixture of the preceding or perhaps not of a delineable kind at all.

<sup>28</sup> The words, "presumption", "tacit", "intuitive", and "unconscious" are used throughout this chapter. While each has nuanced meaning, it should be noted that their meaning is not so radically disparate as to undermine any major points.

<sup>29</sup> Boyer refers to them as "intuitive ontology" and De Cruz and De Smedt refer to them as "intuitive ontologies" insofar as they recognize both epistemological contextualism and cognitive diversity.

be salient.<sup>30</sup> Understanding the constitutive intuitive ontologies is a necessary condition for understanding the range of possible inferences about the natural world. It is debated whether domain-specificity is a fruitful or conformational theoretical position within the cognitive sciences – as there are competing theories. For instance, Atran (1994; 1998) has argued and empirically demonstrated cross-cultural similarities in the structure of biological taxa insofar as plants and animals are conceptualized as essence-based, species-like, and ranked in a nonarbitrary level structure. For these reasons, Atran concludes that there exists a domain-specific cognitive structure for the organization of taxonomic knowledge as its hard core remains despite diverse historical, social, and cultural situations – though, he admits, these situations can trigger and condition the stability of a folk biological knowledge structure. Much more work needs to be done to make our theories of what dimensions of the mind might be innate and inherited responsive to empirical evidence. Before delving into this issue further, however, the next section considers those thinkers who have argued that nothing, or very little, is innate.

### **Section 2.3: Minds and Nurture**

Empiricism, in its philosophical instantiation, can be traced to philosophers Locke, Berkeley, and Hume during the modern period. These philosophers certainly had nuanced views, but the overarching similarity is the denial of cognitive nativism or the existence of innate ideas. The historical roots of empiricism are closely tied to the development of

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<sup>30</sup> If we hold the claim that scientific epistemology is not discontinuous with human knowledge in general. Atran (1998) finds the application of scientific thinking to folk or commonsense thinking problematic. He notes that the assumed continuity of science with commonsense is itself a holdover of both Russell and Quine. I think his concern, though, lies more with those who wish to analyze commonsense thinking in scientific terms. For instance, consider Paul Churchland's interminable fixation on a QS-theory status for folk psychology (recall from Chapter 1) and his argument that such a QS theory constituted by propositions is ontologically vacuous qua a completed neuroscience. Atran would probably counter that applying quasi-scientific status to folk psychology is a category error since folk psychology is not a theory.

associationist psychology. British associationism, as it was called, held that there was one fundamental mental law – association. By association, they meant that thoughts, mental states, are related to one another by their relation in experience. For instance, Hobbes writes in *Leviathan* (1651/1968),

Concerning the thoughts of man, I will consider them first singly, and afterwards in train, or dependence upon one another...The original of them all is that which we call 'sense' for there is no conception in a man's mind which hath not at first, totally or by parts, been begotten upon the organs of sense...As we have no imagination, whereof we have not formerly had sense, in whole or in parts, so we have no transition from one imagination to another, whereof we never had the like in our senses...All fancies are motions within us, relics of those made in sense; and those motions that immediately succeeded one another in the sense continue also together after sense (Ch. 1).

Lockean associationism, stated in *An Essay Concerning Human Understanding* (1690/2007), refers to how we can combine simple ideas in consciousness to produce new and more complex ideas. Humean associationism, stated in both *A Treatise of Human Nature* (1739/1968) and *An Enquiry Concerning Human Understanding* (1748/1977), placed emphasis on the concept of habit and habituation – a fundamental idea which would dominate much of associationist psychology well into the 20th C. Late 19th and Early 20th C. associationist psychology moved the laws of association from the abstract realm of “ideas” and “impressions” toward a materialist language of psychical phenomena. Impressions were now described as biological fact. For instance, consider French positivist and psychologist Théodule-Armand Ribot. In his 1895 essay *Les Maladies de la mémoire (Diseases of Memory)*, Ribot makes explicit his theoretical stance on the workings of memory,

The modification impressed upon the cerebral cells was persistent; the dynamical associations of the nervous elements were stable; the state of consciousness connected with each was evolved; these states of consciousness were reassociated and constituted a series (phrases or verses) (Ribot, 1977, p. 12).

That memories are stored in the brain was the common assumption among most of the positivist psychologists of the time. Furthermore, the associationists of era held fast to the kinds of psychological laws formulated by their British associationist antecedents. Consider French positivist sociologist Hippolyte Taine's view on the associations, "Consequently, the mental law which connects our two thoughts is as general as the physical or moral law which connects the two facts" (Taine, 1871, p. 389-390). Other early pioneers of associationism were psychologist and philosopher William James (1890) and physiologist Ivan Pavlov. Finally, and while conceptually distinct, the law-like relations between physical facts of the traditional associationist was also instrumental in the behaviorism of Watson (1930) and Skinner (1938). Both Watson and Skinner rejected the mind as a necessary construct for a successful science (Watson for metaphysical reasons and Skinner for methodological reasons). Behaviorists shifted physical associations from mental facts to physical behavioral facts. Relations were determined not between impressions, but rather explained as between stimulus and response. Regardless, we might say that both of these – associationists and behaviorists – fell under the general category of empiricism. That both approaches are distinctly empiricist, yet widely vary on the matter of the mental is an important consideration when undertaking an inherited ontologies analysis. When can we pinpoint the mental/behavioral split amongst empiricists? And, furthermore, the behaviorist split from introspective psychology was a function of the former's criticism of the latter as not "scientific enough". If we are to understand and build a positive working relationship between philosophy of mind and the Cognitive Sciences, we must take seriously Watson's criticisms of introspectionist psychology as too speculative (Watson, 1913).

The explanatory dominance of modularity after the cognitive revolution, and its vociferous supporters<sup>31</sup>, left empiricist associationist accounts of mind in constant question, but not completely defeated. On the limitations of associationism, Bever, Fodor, and Garrett (1968) argue that one, “any behavior that can be characterized by associative principles can *ipso facto* be characterized by the more powerful models” (p. 585), and two, that associationism is insufficient for explaining and predicting some behaviors. They write, “Lashley showed that, for a great variety of behaviors...a left member of a chain is dependent upon a nonadjacent right member” (p. 583). Though Fodor and others served to discredit associationist approaches, many psychologists (Collins & Loftus, 1975; Anderson, 1983) continued the associationist program through the use of semantic memory network modeling proposed by Quillian (1967).<sup>32</sup> Indeed, many researchers in the field of cognitive psychology maintained the associationist program even as they shifted from the behaviorist tradition into the cognitivist tradition. This persistence of associationism is not surprising since the cognitivist tradition, while completely rejecting the behaviorist assumptions,<sup>33</sup> does not make computational modularism a necessary condition of acceptance in the field.

Recently, though, empiricism has been revived under the banner of *connectionism* by co-authors cognitive neuroscientist James McClelland and psychologist David Rumelhart (1986) and psycholinguist Jeffrey Elman (1993). McClelland and Rumelhart never explicitly refer to their project as connectionism, but, rather, *parallel distributed processing* (or PDP) although connectionism and PDP have generally come to denote the same thing.

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<sup>31</sup> Jerry Fodor’s powerful defenses of modularism and anti-behaviorist writing earned him the title “Chomsky’s Bulldog”, an obvious reference to Thomas Huxley’s title “Darwin’s Bulldog” for his defense of Darwin’s theory of evolution by natural selection.

<sup>32</sup> Some often confuse the notion of semantic networks with connectionist neural networks, but they are distinct (cf. Coltheart, 2004).

<sup>33</sup> Some have argued that the behaviorist tradition never really died since behavioral analysis in the lab is quite pervasive (cf. Roediger, 2004).



Connectionism, broadly, is a theoretical framework which incorporates *neural networks*.

According to Horgan and Tienson (1996),

A connectionist system, or *neural network*, consists of a large number of very simple neuron-like processors, called *nodes* or *units*, that send simple excitatory and inhibitory signals to one another. Nodes are turned on (activated) or turned off by incoming signals, which depend on the output of connected nodes and the strength of the connection (“weight”) between them (p. 27).

Connectionism, like associationism before it, is regarded as the main opponent of the computational theory of mind. Whereas the computational theory of mind relies on the idea that thought is rule-guided from a central processing unit, connectionism incorporates the thesis that computations are performed locally in nodes and, furthermore, that experience in the world serves as the main input and guides activation sequences for the units in a neural net.

To wit, I have shown two different sets of inherited ontologies – folk psychology and concepts of the architecture of human minds – and traced both their ontogeny and phylogeny. This strategy was possible as both sets have their individual conceptual histories and their cross-disciplinary relationships. I have attempted to focus on them as concepts within, on the one hand, philosophy of mind and the Cognitive Sciences on the other. The inherited ontologies analysis allowed us to step away from the oftentimes complex and engaging arguments for either empiricism or modularism and study what kinds of benefits theoretical competition can engender. On this competition, the relationship I want to emphasize between the philosophy of mind and the Cognitive Sciences is one which fosters cooperation in even the fiercest competition, thus extending the biological metaphor even further. The two cases I demonstrated in Chapters 1 and 2 show two fundamental problems: (1) abstract universalization of mental semantics and mental ontology, and (2) privileging

approaches to explaining minds. Abstract universalization of mental explanation seems to be characteristic of philosophy of mind, in particular, but, as we will see in Chapter 3, the Cognitive Sciences have some foundational implicit assumptions which are problematic much as talk of “thought in the abstract” as possible. In Chapter 3, I should like to emphasize the idea that our goal should not be to explain “what is mind in the abstract”, but, rather, to answer the question “how do minds vary?” Secondly, I also make explicit kinds of minds and how the idea of kinds of minds has been manifested historically. The idea of “kinds of minds” and their relations then turns minds back onto the cognitive sciences and how this is an apt metaphor for productive collaboration through conflict.

## Chapter Three

### Against Privileged Approaches

The preceding chapters refer to a number of theoretical stances which intersect and manifest in differing ways: Folk psychology, nativism, empiricism, modularity, associationism, computationalism, and connectionism. Traditionally, relations between the theoretical stances discussed in Chapter 2 break into two broad categories: (a) nativism, modularity, and computationalism; and (b) empiricism, associationism, and connectionism. These two categories (a) and (b) are then pitted against one another both in the lab and in journal articles. In the philosophy of mind, the debate between those espousing classic computational theory of mind on the one hand and connectionism on the other often breaks down into an ideological turf war between nature and nurture. While conflict is a beneficial condition of a productive working relationship, the kinds of conflict seen amongst the possible theoretical positions within the cognitive sciences does not seem to instantiate a beneficial kind of conflict because the battle is two-sided and each side claims victory for itself alone. There are more and less productive ways of conceptualizing the role that disagreement plays in the growth of our understanding of our own minds. In particular, there may be many sides that only achieve “victory” by challenging each other to be more

clear and more responsive to evidence and as we see in this chapter, more aware of the origins of our ideas and their social consequences for the future.

One of the goals of this thesis is to present a historically informed argument against uniformity throughout the cognitive sciences. As noted in Chapter 1, the cognitive sciences are constituted by a core of seven disciplines each of which has its own foundational principles and methods. I explicitly rejected uniformity as the collapsing the methods and foundations of one discipline into the other, but maintained the idea of unity as it relates to developing a common purpose and sharing a defined problem space. Furthermore, there are a number of other “bridge disciplines” which have emerged from the relations between those seven disciplines and with disciplines outside of them. In the first section, I argue for a new conceptualization of the cognitive sciences which maintains their unique identities, but pursues a common goal. This relates to my previous discussion of the idea of diverse approaches to shared problem spaces as a way of developing multi-dimensional solutions.

### **Section 3.1: Darwinian Minds and the Argument from Evolutionary Biology**

I again return to biology for an elegant solution to a problem within the cognitive sciences. Charles Darwin speculated the following,

In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation (Darwin, 1859/1996, p. 394).

Many did not incorporate this insight into their psychological research until well into the 20th C. The cognitive sciences, as a loosely affiliated set of disciplines, mostly arose together in the cognitive revolution (with computational theoretical foundations) as I detailed in Chapter 2. It did not come to ascendancy in a revolution of biological origin. I think this

early neglect of biology was problematic. I have explicitly stated the diversity of the cognitive sciences is both functionally and intrinsically good, but I wish to propose one way in which the multiplicity of cognitive sciences may unite in a common purpose. If the cognitive sciences bring their foundations in contact with contemporary evolutionary biology, then progressive development could be predicated upon human cognitive diversity. Human beings and human capacities are biological facts which no one can seriously deny.<sup>34</sup> Furthermore, there are facts to be explained by sciences which take as their model the biological approach: to explain individual variation. Cognitive anthropologist Stephen Levinson (2012) agrees and argues that the cognitive sciences have been stagnant under the classical model. In fact, he writes,

The cognitive science revolution was based on a fundamental idealization, the myth of 'the human mind.' Research on human vision, audition, memory, categorization, or the like presumes a single mental capacity, idealized away from all the 'noise' of individual variation or systematic cultural diversity, (p. 397).

He goes on to state, "This is the original sin of the cognitive sciences – the denial of variation and diversity in human cognition" (p. 397). The "original sin" is evidenced by thinkers from analytic philosophy of mind as they sought to explain cognition as something conceivable, and therefore possible, in the abstract.

In Chapter 1 I alluded to this general conceptual attitude in my discussion of criticisms of the central-state identity theory. Philosophers criticized identity theory for its parochial nature and its inability to be generalized to non-human animals and non-human beings whose biology was unlike our own (McCauley, 2012). Locating cognition over and above the human organismic constitution is a major mistake of our contemporary attempts

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<sup>34</sup> I simply do not engage those who wish to partake in evolution denial.

at understanding minds. The attempt to universalize thought into a conceptual realm devoid of any particular content is an inherited platonist understanding of philosophical method. Furthermore, recall that in Chapter 1 I referred to “Jones’s problem” in my discussion of Wilfrid Sellars’ thought experiment of how we might conceive of a mental state attribution heuristic. Jones’s problem, I think, is that the mental state attribution heuristic assumes a level of universality of mental states. Sellars’ approach is another instance of the “original sin” within the cognitive sciences. Another instance of the original sin, which I shall explore in depth, is manifested in the following definition of cognitive psychology from Gazzaniga, Mangun, and Ivry (2002),

Cognitive psychology: A branch of psychology that studies how the mind internally represents the external world and performs the mental computations required for all aspects of thinking. Cognitive psychologists study the vast set of mental operations associated with such things as perception, attention, memory, language, and problem solving (p. G-3).

Built directly into the given *definiens* are a number of problems to be considered: First, the object of cognitive psychological inquiry is limited to, “*the mind*”. Instead of something which spatio-temporally varies, it is posited as *one thing* even as it is distributed among many individuals. Critics may scoff at my distinction between *the mind* and *minds* as linguistic caviling in this particular definition, but what can begin as semantic opacity can end as ontological confusion. This kind of lack of clarity may lead us to presume that what exists must reflect the limitations of our terminology. Second, in the given definition of cognitive psychology, all thinking is computational and mental representations are supposed as a necessary condition for mental computation. Suppose we can conceive of an individual who might be incapable of satisfying the necessary conditions for a “mental representation”. Since such an insufficiency disallows mental computation it therefore makes one incapable of *thinking*. It seems we are all one negated proposition from non-thinking if we adopt the

theoretical conditions of the classical theoretical stance understood as a list of necessary and sufficient conditions that must be met before individuals can be regarded as thinking beings. Third, the extension of an enumerated list of perception, attention, memory, language, and problem solving is a list of presumably natural kinds. But as we saw at the conclusion of Chapter 2, some concepts which we think are of an essential nature may actually dissociate into multiple concepts upon closer analysis.

From the perspective of this thesis, Levinson (2012) is right. Even though the common thread in the cognitive sciences is a shared commitment to understanding relationships between the mind, the brain, and the world by understanding these complex relationships under a single uniform model we have made an egregious error. When we say “the mind” and “the brain” we are led to suppose that these entities are *ding an sich*, or, *things-in-themselves*. There is no a priori reason to suppose that there are *not* numerous different kinds of minds. Rather, it is an empirically supported phenomenon that brains and minds are not something fixed and unchanging (Teki, et al., 2012; Wollett & Maguire, 2011). These findings not only remind us that we are tracking a moving target (as the brain changes with experience), but also warn against unwarranted hypostatization of “the mind” as possessed, or not, by distinct individuals. In the next section, we will see how the idea of the diversity of cognitive capacities and the diversity of cognitive styles is manifested in a particular historical milieu. The idea of human cognitive diversity can be analyzed using the same historical-etiological approach of inherited ontologies developed earlier. Furthermore, I will use some work of Henri Poincaré on the epistemology of scientific method to demonstrate two of my larger points in the thesis – (1) minds are not an essential type and (2) different kinds of

minds need one another to engender new cognitive and intellectual possibilities. By taking cognitive diversity seriously, we explicitly engage social dimensions of the cognitive sciences.

### Section 3.2: Minds and History

To suppose that there exists a multiplicity of minds is a historically situated claim. For instance, Pierre Duhem, Henri Poincaré, and Emile Boutroux explicitly committed themselves to at least two kinds of minds: *l'esprit de finesse* and *l'esprit de géométrie*. These two kinds of minds which were widely discussed amongst the *Belle Epoch* intelligentsia descended from Pascal's (1670/1991) faculties of knowledge developed in the *Pensées*. For Pascal, there are two constitutive and parallel components of human rationality and they carry disparate epistemic desiderata. Pascal accepted a theory of thought which relied upon the idea of separate "faculties" for cognitive functions which seemed qualitatively and intuitively different from one another.<sup>35</sup> For Pascal, on the one hand, *l'esprit de géométrie* comes to know through rational deliberation. On the other hand, *l'esprit de finesse* comes to know *d'un seul regard*, or "at first glance." Pascal establishes these separate faculties within individual epistemic agents to equate mathematical/logical certainty and transcendental/religious certainty to the same status. Pascal was both a deeply religious man as well as a mathematician who found it necessary to justify both of his endeavors with a level of certainty. Pascal's concept of kinds of faculties underwent a series of changes in the late 19th C.

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<sup>35</sup> The most basic and intuitive faculties are usually a faculty for "reason" and a faculty for "emotion". Even this may seem counterintuitive to some and, furthermore, it does not even seem to hold up to empirical research. So, as it seems, the distinction between reason and emotion is another analyzable instance of an inherited ontology.



The French intellectuals of the late 19th C. turned from Pascal's assertion that individuals had these two faculties to the claim that *l'esprit de geometrie* and *l'esprit de finesse* applied most aptly to different kinds of agents. This means that I might be best classed as possessing *l'esprit de finesse* with my acuity for patterns and meaning in the most unorganized and implicit of information. Others with differing intuitions may see nothing in that kind of information, but fare much better with explicit instructions. We would class those individuals as possessing *l'esprit de geometrie*. Duhem explicates these two kinds of minds in *The Aim and Structure of Physical Theory* (1906/1954). He calls them the ample mind and the deep mind. For Duhem, this distinction serves to show two ways in which science may proceed. Duhem channels Pascal by referring to the ample mind as *l'esprit de finesse* and the deep mind as *l'esprit geometrie*. Duhem's flaw, though, was classing kinds of minds as "French minds" and "British minds" and developing the "German mind" that is both obtuse and foolish. Duhem's nationalistic bias serves as another instance of concepts gone awry. It is not enough to simply acknowledge cognitive or intellectual differences among people and then rank one as somehow superior to another. Instead, we must value cognitive or intellectual difference as a beneficial resource. The insight that cognitive diversity is important and that minds need one another is the insight of another French intellectual, the mathematician, physicist, and philosopher Henri Poincaré. Poincaré writes in *Les Sciences et Les Humanites*,

Mais pour inventer par induction, il faut deviner, il faut choisir. On ne peut pas attendre d'avoir la certitude, il faut se contenter de l'intuition. Ici l'esprit géométrique pur est en défaut; il nous faut quelque chose de plus, et ce quelque chose c'est l'esprit de finesse tel que je viens de le définir (Poincare, 1900-1912).

This passage translates as,

But in order to invent via induction, we must guess, we must choose. One cannot expect certainty, we must be content with intuition. Here is where the pure *l'esprit géométrique* fails; we need something more, and that something is the *l'esprit de finesse* which I have defined (Poincaré, my translation maintaining the original French).

Poincaré sees *l'esprit de finesse* as a mind which has the capacity to see patterns and meaningful connections in even the most meaningless “noise”. Or, at least from the perspective of *l'esprit de géométrie*, it would seem to be meaningless noise. Poincaré recognized that human cognitive diversity was both a fact to be explained as well as a benefit to the growth of knowledge. The kinds of minds which Poincaré posited were not simply different kinds of minds suited to different tasks in different problem spaces, but rather Poincaré asserts the necessity of these minds working together in a single problem space. One kind of mind can perform its tasks and only make it so far before the other mind must interact and engender new and previously unseen possibilities. This interaction serves to solve extant problems but can also redefine the possible dimensions of the problem space itself – or both.

The inherited idea of kinds of thinking within minds of Pascal to kinds of minds among agents in the French academic milieu of the *Belle Epoch* serves to underscore the historical situatedness of the idea of minds as diverse and variable across individuals. I do not mean to suggest that *no* cognitive scientists take seriously the idea that minds vary and that *no* cognitive scientists study this variation. Rather, I supply my view merely as (1) understanding of the distillation of views within both the Cognitive Sciences and the philosophy of mind, and (2) a positive view which could serve as a self-conscious measuring stick for those doing work in the cognitive sciences. For it is the interaction with others bearing differing intuitions which often serves to enlighten us of our own implicit intuitions. On this second point, the cognitive scientist must ask herself, “How does this research factor into understanding human cognitive diversity as a biological fact?” E.O. Wilson’s

(2013) claim that the humanities have focused only on the particularities of human nature and have not explained why humans possess a special nature and not some other out of a vast number of conceivable possibilities misses the point. Ramsey (2012) argues that essentialist conceptions of human nature are problematic because their ontological assumptions are philosophically suspect in a post-Darwinian world. He suggests that others have taken the impossibility of an essentialist account to indicate the elimination of “human nature” from our philosophical vocabulary. Ramsey disagrees and offers his own account of human nature which addresses human individual variation. One of Ramsey’s motivating strategies is to channel Darwin’s insight that there is no essential quality of a species. Contra Wilson, both Ramsey and I argue that it is the particularities of “human nature” that makes humans special as a kind of species and it is those particularities which the cognitive sciences must study. Opponents of this claim will argue that particularity, as opposed to generality, is not the domain of the scientific enterprise. Its goal is to make generalizations from data so to argue that the cognitive sciences ought to study human particularity would make those sciences something other than a science – by definition. I will address this point fully in the next section where I undertake criticisms of my position as well as think in broad strokes about the future of the cognitive sciences after the speculative psychological turn and the social implications of this turn.

### **Section 3.3: Minds and the Future**

The important point to consider before drawing this thesis to a close is how to move forward as cognitive scientists and also consider the social implications in light of the considerations and arguments offered in the preceding chapters. Recall that Fodor (1983) suggested that speculative psychology before the institutional break between philosophy and

psychology attempted to pay close attention to empirical data while working through conceptual problems. So, if I am right, then the next step is to take an explicit speculative psychology turn. By taking this turn, we can expect the kind of conflict we have seen amongst the cognitive sciences to continue. I think if we expect otherwise we would be mistaken about the process of knowledge production. However, the difference after the speculative psychological turn would be a commitment to adopt a common understanding that the goal is to explain human cognitive variation and that active engagement and intentional disputation between all of the cognitive sciences in the same problem space is beneficial. Turning back to the last section, consider Poincaré's suggestion that minds vary and interact in meaningful and productive ways. This observation should serve both as (a) a realization for us to understand individual cognitive variation, and (b) an incentive to change how we think about the interaction between the philosophy of mind and the Cognitive Sciences.

On the first point, if we accept Poincaré's observation that minds meaningfully vary, then we must allow this awareness to imbue both our personal relations and views and also how the cognitive sciences proceed from a set base of assumptions. Reconceptualizing the individual as one mind among many different kinds of minds is an assumption which changes the way in which we begin a science of cognition. In lieu of beginning by conceptualizing thought as something universal and unchanging, we accept the argument from evolutionary biology given above and view variation in minds not as a problem to be solved, but, rather, as a complex network of related facts to be explained. Our explanations will show how our differences contribute to our fitness rather than detract from it.

Throughout this thesis I have shown both problematic instances of research and practices within the cognitive sciences (universal nomic relations among mental states and behavior; privileging mental architectures; and so on) as well as positive and productive relations (Machery and concepts; Ramachandran on the self; Baxter and memory versus perception; and so on), but it has not addressed a major problem of the workings of the sciences themselves. A commitment to the speculative psychology turn will ensure that the kinds of research which we develop in the future will adhere to the standards of work in the latter category of positive and productive relations. One might question whether the Cognitive Sciences ought to study particularities instead of generalities because to do so would be to not undertake the task of science in the first place – to study generality. This counter-argument misunderstands both my argument and the methods of research in the Cognitive Sciences. Of course the goal of the sciences is to make theoretical and statistical generalizations from empirical observation and experiment, but the way in which generalizations are reached is significant. Consider the use of the statistical method of analysis of variance (ANOVA). Very simply, an ANOVA is a statistical test which tests whether or not the means of two groups (one experimental group provided with some treatment and one control group) are equal. The ANOVA averages the mean differences within the groups (how means vary within the control or experimental group) and between the two groups. The latter is taken to be of the utmost importance as it indicates whether or not the treatment administered was effective. The former is generally taken to be error which must be mathematically overcome. On my account, it is the reasons for the individual variation within the groups which is fertile grounds for research. I neither doubt nor refute the importance of the overall difference between groups, but I find the within group variation to be of equal importance and not “noise”. This observation still does not counter

the objection that studying particularity makes a science a non-science. My argument is that the study of individuals in the way that I have just detailed can offer the experimentalist a unique opportunity to explain and describe patterns which emerge from individual variation. Suppose that the differences in means from the within-group variation in the experimental group track a meaningful cognitive difference. Our experimenter is in unique position to develop and explain patterns of difference amongst these individuals and, thus, make generalizations about patterns of cognition (or behavior) from studying individual difference.

Recent research from the subdiscipline of experimental philosophy<sup>36</sup> has taken an empirical and scientific approach to studying individual difference. Specifically, research performed by Knobe (2003) shows that intuitions about the concept of intentional action differ among individuals; these differences have implications for accounts of moral responsibility. Knobe presented subjects with two vignettes. In both vignettes, participants were asked to suppose that the CEO of a company is presented with a proposal which has a side-effect on the environment. In one vignette, the side-effect is that the proposal helps the environment and, in the other, the side-effect harms the environment. A majority of participants conclude that the CEO intentionally harmed the environment, but, in the other case, a majority of participants do not conclude that the CEO intended to help the environment. This asymmetry in willingness to attribute intentional action to an individual has been dubbed “The Kobe Effect” (Nichols & Ulatowski, 2007). Nichols and Ulatowski (2007) undertake an analysis of the reason for within-group variation amongst the participants’ answers to the vignettes.<sup>37</sup> Specifically, Nichols and Ulatowski consider the robust statistical minorities of participants who conclude that the CEO did not harm the

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<sup>36</sup> Experimental philosophy uses methods akin to those in experimental psychology.

<sup>37</sup> They term the two groups “Harm” and “Help” for textual brevity.

environment intentionally and that the CEO did not intentionally help the environment.<sup>38</sup>

Nichols and Ulatowski offer an explanans for the minority called *interpretive diversity*,

The minority who said that the CEO didn't intentionally harm the environment in Harm also said that the CEO didn't intentionally help the environment in Help. And the minority who said that the CEO intentionally helped the environment in Help also said that the CEO intentionally harmed the environment in Harm. What do we say in light of the consistent responses of these two minorities? Our hypothesis is that 'intentional' exhibits *interpretive diversity*, i.e., it admits of different interpretations (p. 12).

Interpretive diversity holds that the statistical minority is explained by two alternative implicatures of the concept of intentional action. In one sense, the participant understands the implicature of intentional action to be that an agent has *foreknowledge* of consequences. In the other sense, the participant understands the implicature of intentional action to be a *motive*. Nichols and Ulatowski suggest that the minority groups consistently understand intentional action in either one or the other way. On the majority view, they argue, participants are flexible in their definition of intentional action.

Of course, as I stated in the introduction, my thesis is a proposal from an academic to academics and, though noble, does not directly engage with the allocation of funding in the form of grants from large goal-oriented institutions. While I did not address this large and complex in this thesis it remains a major factor which must be taken on for the speculative psychology turn to gain traction. The hope is that a general shift in the perspective of cognitive scientists will encourage a general shift in perspective of all those involved in cognitive scientific research construed broadly to include historians and philosophers of mind. For the Cognitive Scientists, more narrowly construed, having an understanding of the history of concepts used in developing research questions is a step in

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<sup>38</sup> "Robust" is used in its technical sense here since the "Knope Effect" has been replicated in other labs with a consistent minority of responses following a particular pattern.

the right direction toward not relying on unexamined premises and dubious assumptions.

Throughout this thesis, we have seen how tacit and unconscious acceptance of a stale concept as presented in a literature review can lead to its reification and the production of a model, theory, or effect which overlooked more important dimensions of the problem at hand.



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