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EVERYDAY CRITICALITY:
QUESTIONING, EXPERTISE, AND THE EMBODIMENT OF CRITICAL
JUDGMENT

A DISSERTATION

Submitted to the Faculty of
Montclair State University in partial fulfillment
of the requirements
for the degree of Doctor of Education

by

DANIEL FISHERMAN

Montclair State University

Upper Montclair, NJ

2017

Dissertation Chair: Mark Weinstein

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MONTCLAIR STATE UNIVERSITY

THE GRADUATE SCHOOL

DISSERTATION APPROVAL

We hereby approve the Dissertation

EVERYDAY CRITICALITY:

QUESTIONING, EXPERTISE, AND THE EMBODIMENT OF CRITICAL

JUDGMENT

of

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Doctor of Education

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ABSTRACT

EVERYDAY CRITICALITY:
QUESTIONING, EXPERTISE, AND THE EMBODIMENT OF CRITICAL
JUDGMENT

by Daniel Fisherman

The development of critical disposition, and particularly the disposition to question assertions, has long been viewed as an essential goal of education. Its importance is expressed not only in numerous normative educational visions, but by contemporary policy documents, studies of teacher attitudes, and even popular educational literature. Indeed, the movement to educate for higher-order, critical thinking that has developed over the past four decades views questioning as perhaps the central activity of skilled cognition. As such, the disposition to question assertions – or what I have come to call “criticality” - transcends both the classroom and any specific academic or vocational discipline. It is essential to all good thinking, whether such thinking concerns scientific research, workplace decision making, or the navigation of everyday life.

While there has been little conceptual analysis of criticality per se, there exists a substantial and relevant literature concerning the nature of critical disposition. In this dissertation, I analyze the two dominant conceptions in the literature as they relate to criticality, evaluating them with regard to both our held critical ideal of appropriate questioning, as well as a paradox that arises from the nature of the critical act itself – what I call the paradox of criticality. I argue that both conceptions fail to justify our

critical ideal and offer little insight into how we can end the iterative questioning of critical behavior without paradoxically engaging in an “acritical” act. I propose that any understanding of criticality capable of supporting a commitment to appropriate questioning must view critical behavior as a form of judgment.

With this in mind, I incorporate Hubert Dreyfus’ theory of expertise into a phenomenological analysis of critical recognition to develop a conception of criticality that views such recognition as an act of judgment that itself relies on the embodiment of previous judgment. I then turn to the literature on neurocognition and consciousness for empirical backing of this conception, arguing that both dual cognition and global workspace theory provide substantial justification for a commitment to it. I conclude with a discussion of the educational ramifications of the expertise conception and the role that didactic philosophy might play in an education for criticality.

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For a 51-year-old individual with a family and a long career in technology, a seven-year journey towards a doctorate presents some daunting logistical, emotional, and yes, even cognitive challenges. That I have made it to this point is particularly gratifying given that this is not my first attempt at the degree. As such, I have more than a few friends, family, and mentors who I would like to thank.

Pablo Tinio agreed to join my committee without knowing my work or ideas beforehand. Maughn Gregory and David Kennedy have long welcomed me into the P4C community, and helped me develop a theoretical foundation for my work with children. And in her criticisms of the critical thinking movement, Michele Knobel helped me recognize the importance of moving beyond the existing parameters of its discourse.

Perhaps more than he knows, my graduate school partner, Igor Jasinski, played no small part in the development of this dissertation. His endless support and critique of my ideas gave me the opportunity to articulate and justify at an early stage the core of this work. Tyson Lewis showed me what it meant to engage in true study, leading me into corners of philosophy that pulled me out of my analytic comfort zone. His enthusiasm for being a philosopher revived in me the feelings that first attracted me to the discipline thirty years ago. Mark Weinstein reined me in when my thinking threatened to turn to fantasy. His spot-on critique, particularly when it came to my elaboration of criticality as a form of judgment, is responsible for whatever clarity this work exhibits. He is, in a substantial sense, the grandfather of this dissertation.

My deepest gratitude and love goes to my wife, Jen, and children, Noam and Ava. It would have been easy for me to hole up at my desk for longer than was healthy, but having the opportunity to spend time playing Ultimate, watching Curb and Louis CK, playing games, cooking dinner, and helping my children to grow into loving and talented young adults has been a source of everyday happiness. More than anyone, Jen has inspired me to stick to my goal, patiently enduring many hours of discourse on a topic that was likely not her primary interest. Her questions, comments, and constant encouragement proved as valuable as any during my time producing this work.

For my brother Gil, for whom questioning was,
sadly, more a source of pain than joy.

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Chapter 1: Introduction

The development of critical disposition, and particularly the disposition to question assertions, has long been viewed as an essential goal of education. Its importance is expressed not only in numerous normative educational visions (for example Adorno, 1998; Dewey, 1910; Freire, 1996; Scheffler, 1995; Lipman, 2003) , but by contemporary policy documents (Common Core State Standards Initiative, 2010; National Research Council, 1996), studies of teacher attitudes (Eshach, Dor-Ziderman, & Yefroimsky, 2014), and even popular educational literature (for example, Berger, 2014; Wagner, 2012). Indeed, the movement to educate for higher-order, critical thinking that has developed over the past four decades views questioning as perhaps the central activity of skilled cognition (see Costa & Garmston, 2001; Facione, 1990). As such, the disposition to question assertions – or what I have come to call “criticality” - transcends both the classroom and any specific academic or vocational discipline. It is essential to all good thinking, whether such thinking concerns scientific research, workplace decision making, or the navigation of everyday life.

Given the pedagogical primacy of criticality, one would expect teachers to create an educational environment that nurtures questioning, particularly questioning that expresses a curiosity about the world and a healthy skepticism toward assumed belief. Yet studies have consistently indicated a disproportionate classroom emphasis on procedural questions and questions of lower-order recall (Eshach, Dor-Ziderman, & Yefroimsky, 2014; Gall, M., 1970; Gall, 1984; Wertsch & Smolka, 1993; Chin, 2004). Such questioning would seem to be at odds with the development of criticality,

encouraging students to view questions merely as a means of publicly expressing already known answers rather than to define an unknown worthy of inquiry. Wertsch and Smolka (1993) describe the established social interaction surrounding classroom questioning in almost behavioristic terms, where an inquiry request initiated by the teacher is met with a student response that is followed by teacher evaluation - a pedagogical approach they aptly term "I-R-E." As the dominant means of engaging the activity of questioning, such a technique would seem to present a serious challenge to fulfilling normative pedagogical ends.

In this work, I seek to address this disconnect between the goal of criticality and the actuality of critical questioning in the classroom. And I do so from both philosophic and scientific perspectives, emphasizing their potential commonality and mutual epistemic support. How such a disconnect could exist is certainly a matter for extended debate, but as I suggest below, the way we understand the causes and purpose of critical questioning encourages just such a situation. For in believing that we generally search for questions to ask, we mistakenly put the onus for criticality on willful motivation. That is, we end up believing that we can be curious, inquisitive, and appropriately skeptical if we are only willfully motivated to behave that way. Such belief strikes me as speciously simplistic and suggests an uncoupling between the questions we encourage in the classroom and how individuals behave outside of it. As I hope to make clear, to the degree that willful motivation is at all justifiable, it is not so much that we need to be willfully motivated in the present so that we may find questions to ask, but rather that we need to have been willfully motivated in the past to both create the cognitive space and

develop the critical judgment that encourages the “right” questions to find us in the moment. Such a temporal accounting defines a more reasonable role for education when it comes to nurturing criticality, for rather than simply abdicating critical disposition to personal will, it acknowledges the formative power of classroom questioning.

1.1. The issue of criticality

While criticality has long been part of the normative educational landscape (Nussbaum, 2010), its conceptual articulation has been subsumed under broader didactic aims, particularly those defined by the critical thinking and critical pedagogy movements (Facione, 1990; Burbules & Berk, 1999; Giroux, 1994). As such, there has been little sustained discourse devoted to a detailed conceptualization of criticality as I have defined it. The Delphi commission report on critical thinking (Facione, 1990), for example, speaks of recognizing and challenging assumptions as only one element of an idealized critical process. And while critical pedagogy literature emphasizes the need to question assertions, it specifically emphasizes the questioning of socio-political assertions, questioning that seeks to bring awareness to the social power relations that constrain individual action and opportunities (McLaren & Hammer, 1989; Freire, 1996). As a broadly applicable disposition with its own integrity, criticality is thus both in and not in the literature – very much part of the normative conception of education, but lacking its own detailed conceptual articulation.

I would suggest that this lack of articulation is, at least in part, a result of the diverse usage and meaning of the word “critical” in educational and academic contexts. Ostensibly, the term serves to qualify educationally relevant concepts – critical *thinking*,

critical *pedagogy*, and even critical *being* (Dunne, 2015) – suggesting that each has a relation to some common and unified understanding of the term, as is the case with “blue table,” “blue hair,” and “blue sky.” But as part of a well-established phrase labeling a pedagogical aim, a cognitive approach, or even an educational movement, the connection to a common meaning is compromised or even lost. Indeed, the term no longer serves its role as an adjective, but gets incorporated as part of the noun phrase, allowing for a divergence of meaning over time. That such divergence has occurred is evidenced by the odd and unfortunate view that the critical thinking and critical pedagogy movements are now often viewed as mutually antagonistic (Burbules & Berk, 1999). “Criticality,” as the disposition to question assertions, is an attempt to recover that essential and lost commonality among its disparate instantiations. It refers to what makes critical thinking, critical pedagogy, critical being and any other critical X concept essentially critical.

How might we then further elaborate this concept of criticality? To the degree that the concept is educationally relevant, we ought to say more than the brief definition I have offered. For however we analyze the concept, an education for criticality makes sense only if we can articulate a set of “critical levers” – a group of variables whose manipulation holds the promise of influencing behavior toward a critical ideal. Here, we might take a cue from the critical thinking literature, which has exhibited a long-standing acceptance of the well-defined distinction between critical thinking skills and the disposition to use them (Facione, 1990; Abrami, et al., 2008; Facione, 2015). Such a distinction between the act and a tendency to engage the act has proven fruitful, with the resulting conceptual analysis serving two purposes – a better understanding of both act

and tendency, and numerous concrete enumerations of their constituent components. It is, arguably, the latter that has yielded the greater practical influence on the movement to educate for critical thinking, as it has facilitated the operationalization of both concepts, a milestone that in turn, has spawned an entire industry of critical thinking programs and assessments at all levels of education, from primary school through professional training (see InsightAssessment.com, CriticalThinking.org, CriticalThinking.com, ThinkWatson.com). Regardless of one's opinion of the commodification and, indeed, commercialization, of critical thinking, the fact remains that the push for critical thinking education has successfully harnessed the conceptual analysis of both the critical thinking act and tendency as the foundation for its didactic aims. Such an example, I would suggest, offers reason enough to put the concept of criticality through a similar analysis.

In taking this approach, we are thus faced with the task of detailing not just the tendency to question assertions, but the act itself. And while it seems reasonable to seek critical levers for modulating the tendency, it is not immediately clear how we might further elaborate the act. Indeed, what more is there to say about the act of questioning assertions? At least on the surface, it is not like critical thinking, which as a process carried out over time, lends itself to component description. Questioning an assertion is an atomic act, one that, as a form of challenging assumptions, itself constitutes a building block of the critical thinking process.

And yet, as I argue in Chapter 1, an analysis of the various uses of the term “critical” suggests that there is more to the critical act than the asking of a single question. As both Paul (1984) and Burbules and Berk (1999) explain, critical

engagement entails a deep dive into the epistemic acceptability of a claim, one that requires that we issue interrogative challenges to any initial response. Seen this way, the critical act does define a process. It specifies a reflexive and ongoing reiteration of itself that progressively delves deeper into the justification for an assertion. To the degree that criticality is valued for its utility in helping us decide what to believe and do (Ennis, 1991), such justification is necessary. Yet for the same reason, any proposed justification warrants asking the further question, “Why should we accept that?” It is this question that begins the cycle of interrogation characteristic of critical engagement.

From a theoretical perspective, this iterative aspect of the process presents a problem that threatens to undermine the very concept of criticality. For if criticality demands that every justification be interrogated, there would seem to be no end to the critical process. At least conceptually, any imposed end would entail that we leave some assertion unchallenged, some justification uncritiqued. And yet if criticality is to perform its role in decision-making, some end needs to be imposed. Does this mean that the concept of criticality is itself incoherent, that any decision rendered through the process of critical engagement must be labelled uncritical because it is ultimately founded on an uncritiqued, uninterrogated assertion? This is what I call the paradox of criticality, a paradox whose challenge needs to be addressed in any elaboration of criticality.

That said, critical thinking theorists have tended to avoid this paradox. Consider, for example, Ennis’s well-known definition of critical thinking as “reasonable reflective thinking focused on deciding what to believe or do” (Ennis, 2004). Here, Ennis clearly indicates that the aim of critical thinking is to render epistemic and behavioral judgment.

Yet in requiring that such thinking be reasonable, he preempts any problem with the iterative nature of the critical process. Critical thinking is reasonable thinking, and reasonable thinkers know when to end the iterative process. Indeed, reasonableness provides the criteria for determining the need for ongoing interrogation. Of course, we might suggest that any attempt to invoke reasonableness to end critical interrogation might be itself be met with the question “Why is it reasonable to end interrogation here?” Such a question simply jumpstarts the interrogative loop again, suggesting that Ennis’s articulation of critical thinking avoids the paradox primarily by ignoring it.¹

Assuming that the paradox proves tractable and the integrity of the critical act remains viable, what more might we say about critical disposition beyond its definition as the tendency to iteratively question assertions? And what levers might we articulate that could prove sensitive to education? Again, little has been said that specifically targets the concept of criticality as I have defined it. However, the literature on critical thinking disposition is substantial and long-standing. Historically, the various articulations of this tendency have been presented via proxy, as the intellectual character of the critical thinker. Intellectual character has, in turn, been parsed into a variety of affective characterological attributes, which together are taken as the source of the “consistent internal motivation” for critical engagement (Facione, 2000). While different theorists have offered distinct lists of attributes that slice the concept of intellectual character

¹ I might further note that in the realm of critical thinking, reference to reasonableness concerns more than the iterative loop of interrogation. Rather, it applies to all cognition constituting the critical thinking process, including, for example, interpretation, analysis, evaluation, and even metacognition.

across various taxonomic groupings, the essential character of the concept has remained a constant in the literature. Attributes such as open-mindedness, fair-mindedness, a desire to be well-informed, inquisitiveness, trust in reason, and a desire for truth are all seen as core characteristics of the ideal critical thinker, and are thus treated as dispositional variables susceptible to pedagogic intervention (see Facione, 1990; Facione, 2000; Ennis, 1991).

Most important, the theory of action that implicitly underwrites the efficacy of these attributes requires that they be understood in affective terms. For it is specifically their affective character that provides the impetus – the motivation - to expend the cognitive energy to critically engage. Such affective motivation is evident in the language used to describe the critical thinker, who is said, for example, to have a “zealous dedication to reason, and a hunger or eagerness for reliable information” (Facione, 1990). Presumably, it is the felt character of these attributes that motivates critical behavior, generating a need or desire that bridges what we ought to do and what we tend to do. Scheffler (1991) speaks of these as the “rational passions,” the set of affective traits that are fundamentally linked to our cognitive values and epistemic beliefs – “a love of truth and a contempt for lying, a concern for accuracy in observation and inference, and a corresponding repugnance at error in logic and fact” (p. 4). We are thus presented with a clear, almost graphic, basis for this “motivational” conception of critical disposition. Our meta-epistemic and meta-cognitive beliefs inspire emotion, and such emotion propels us toward critical engagement.

But is motivation a sufficient explanation of critical thinking disposition? And even if it is, are we justified in applying it to an elaboration of criticality? The motivation conception has, indeed, been operationalized as the basis for a number of critical disposition assessments (see Facione, Facione, & Giancarlo, 2001; Giancarlo, Blohm, & Urdan, 2004; Yang, 2009; Fisherman, 2013). And there is some limited evidence that such assessments are both valid and reliable (Facione, 2000). Perkins et al., however, have made both the logical and empirical case that motivation, along with requisite critical thinking skills, is explanatorily insufficient, especially with regard to critical engagement outside the classroom (Perkins, Tishman, Richhart, Donis, & Andrade, 2000; Richhart, 2001; Tishman, 2001; Perkins & Ritchhart, 2004). Instead, they point to an additional factor, critical sensitivity, as perhaps the most significant roadblock to such engagement. As the personal attribute responsible for the recognition of critical opportunities, sensitivity constitutes a prerequisite of critical behavior. Indeed, the various Perkins groups reference empirical studies that suggest that the lack of critical recognition is the greatest obstacle to critical engagement, preventing an appropriate critical response even by individuals who have demonstrated both critical motivation and skill (Perkins, Tishman, Richhart, Donis, & Andrade, 2000; Perkins & Ritchhart, 2004). This, they argue, is particularly true of critical engagement “in the wild,” where critical opportunities are rarely as salient as they are in the classroom, and one’s motivation to critically engage often plays second or third fiddle to other cognitive demands and behavioral goals.

At least on the surface of it, the introduction of sensitivity would thus seem to rectify a significant deficiency of the motivation-only conception. Sensitivity justifiably suggests that, at least in everyday life, being motivated to utilize critical thinking does not ensure its appropriate application. Rather, individuals must also perceive assertions and situations as ones that call for critical intervention. I would argue that the same might be said about criticality. Mere motivation to question is not sufficient to actually question - we further need to perceive assertions (and situations) as being question-*able*, as claims that can be rejected. This, I would suggest, is more than a theoretical matter – it is one that underwrites the value we ascribe to critical engagement. Criticality is held as an educational aim precisely because we believe that individuals tend to hold overly concretized worldviews, confusing historically and culturally contingent belief with universal truth (see Adorno, 1998; hooks, 2009). Such a mistake forecloses the very possibility of critical engagement for even motivated individuals, limiting the perceived scope of what is legitimately questionable.

The question thus becomes whether we ought to accept criticality as the union of motivation and sensitivity. And if we cannot, what conception might we offer that better serves that role? This is where the core of my project begins, as the continuation of a dialogue that seeks to answer the central question “What is critical disposition?” Of course, there is a sense in which I have merely appropriated this dialogue for my own purposes, changing its target from critical thinking to the substantially narrower, though no less important, issue of criticality. But I believe that such appropriation is warranted on two counts. First, in the absence of existing analyses of criticality, the robust literature

devoted to a closely related concept, one that is readily adaptable to the specific concern of critical questioning, offers as good a starting point as any. This is especially true given the thrust of the sensitivity conception, which like criticality, focuses on the initiation of critical engagement. Second, and perhaps more important, criticality is the element common to the various and diverse educational uses of the term “critical.” As such, critical thinking presents access to the concept of criticality through the back door, allowing us to apply at least some of the analysis of a “child” concept to further elaborate its parent.

1.2. The core of the argument

Ultimately, it is my belief that neither the motivation or sensitivity conceptions offer acceptable articulations of critical disposition. Indeed, both conceptions suffer from the same weakness – they fail to provide justification for the accepted critical ideal of appropriate questioning, an ideal based on an implicit standard of warranted questioning. Such an argument, of course, requires further elaboration and defense of appropriate questioning, paying particular attention to the problems that it raises. But assuming that such a case can be made, it seems clear that however we conceive of criticality, it ought to provide reasons for committing to the accepted ideal. And neither motivation or sensitivity offer such reasons. In fact, the motivation conception best justifies an ideal that conflicts with that of appropriateness. This is the ideal of *more* questioning, where one accepts that additional critical questioning is always a virtue. Something similar might be said about sensitivity, where the Perkins elaboration speaks of recognizing critical opportunities only in terms of an increasing or decreasing tendency toward critical

questioning. In neither case are we presented with a means to recognize, and thus target, only those opportunities endorsed as warranted or appropriate.²

Indeed, I argue that the ideal of appropriate questioning implies a conception of critical disposition that must be tied to judgment, where the recognition of critical opportunities is, at least in part, a matter of judging critical warrant in the context of a variety of disparate and fluid considerations. Much of the remainder of this dissertation is devoted to elaborating and defending the viability of such a conception, which I term the Expertise Conception of Criticality.³ I approach this task from two distinct and historically antagonistic perspectives, phenomenological analysis and neurocognitive theory, arguing that both provide mutually supportive justification for a view of criticality founded on judgment. But the fact that these perspectives utilize radically different methodologies and assume potentially conflicting ontologies necessitates a second line of argument, one that concerns the legitimacy of the approach itself. Here, I contest the longstanding antipathy between first-person and third-person methodology, arguing that the viability and relevance of educational neuroscience in particular depends on a degree of acceptance and integration of first-person techniques, data, and even ontology. My hope is that this triangulation of perspective not only lends additional clout to a conception of criticality tied to judgment, but that it provides an example of how

² This argument can be seen as a form of modus tollens, where the derivation of ideals from conceptions requires that we reject any conception that implies an unaccepted, or unacceptable, ideal.

³ That I call this the expertise conception is a nod to the role played by Hubert Dreyfus's theory of expertise in its development. See Dreyfus 1998, 2002, 2008, and 2014 for his elaboration of the theory.

neuroscience and phenomenology might work together to address issues of educational concern.

1.3. The structure of the dissertation

While the dissertation contains these multiple threads, it is structured as a single, winding argument, with each chapter building on the claims of the previous one. The reader might look to the last section of Chapter Three as the nexus of the entire work, as it both ties together the preliminary arguments of the first three chapters to suggest the need for an expertise conception, and provides the launching point for its elaboration and defense. Seen in this manner, the dissertation is comprised of three main arguments, where the first three chapters articulate what might be called the educational argument, and the subsequent two chapters offer the phenomenological and the neurocognitive arguments, respectively. Yet even within each of these, there are a number of core claims that themselves require elaboration and defense. A brief outline of each chapter thus seems useful here, serving to document these claims and account for their role in the flow of the larger argument.

Chapter One introduces the concept of criticality as the disposition toward the iterative interrogation of assertions. I argue that while the term “critical” has been appropriated by a variety of distinct educational concepts, including critical thinking and critical pedagogy, it imparts a common idea to each – that to be critical is to engage in the iterative questioning of assertions. I then introduce the concept of everyday criticality, defining it as criticality in the context of situations where little or no demand for, or expectation of, critical engagement exists.

Chapter Two maintains several goals. First, I discuss some of the theoretical issues concerning criticality that threaten to render the concept incoherent. Most important among these is the paradox of criticality, which plays an important role throughout the dissertation. Second, I seek to establish everyday criticality as an educational aim, arguing that the popular and academic literature advocates for criticality as a pedagogic goal. Finally, I distinguish between a critical ideal of *more* questioning and one founded on the idea of appropriate questioning. I argue that despite calls for more questioning, the ideal of appropriate questioning both is and ought to be the standard for criticality.

In Chapter Three, I explore the viability of the two existing psychological conceptions of critical disposition in light of a commitment to appropriate questioning. I argue that any acceptable conception of everyday criticality must offer reasons for accepting a critical ideal, and that neither the motivation nor the sensitivity conceptions provide justification for an ideal of appropriate questioning. I then propose that the notion of appropriate questioning entails a conception of criticality founded on judgment, where the recognition of critical opportunities is, at least in part, a matter of judging critical warrant in the context of a variety of disparate and fluid considerations.

Chapter Four is devoted to the elaboration of the expertise conception of criticality, a view of critical disposition founded on both the concept of perceived questionability and Hubert Dreyfus's theory of expertise. I define perceived questionability phenomenologically, as the subjective sense of epistemic acceptability that permeates conscious experience, and I discuss its role in the manifestation of critical

recognition. I then utilize Dreyfus's theory of expertise to explain its ties to critical judgment, arguing that the theory offers a means of understanding progress toward the critical ideal in terms of the ongoing development of embodied judgment. I conclude the chapter with an elaboration of embodied judgment as an intellectual virtue, one that expresses the judgments of past critical behavior.

Chapter Five seeks to provide neurocognitive support for the phenomenological articulation of the expertise conception. To this end, I discuss both dual cognition theory and global workspace theory, the latter of which is an empirically supported dual cognition theory of consciousness. I argue that global workspace theory offers much of the necessary neural backing for the expertise conception, providing empirically robust support for the centrality of judgment in both the development of critical expertise and the act of critical recognition. I further explain how global workspace theory explains cognition in a manner that addresses the paradox of criticality, resolving the logical tension in the concept of criticality.

Finally, in Chapter Six, I discuss the educational implications of the expertise conception. I claim that the conception defines two basic levers for the modulation of criticality – care and the environment – that suggest concrete classroom changes if we wish to educate for criticality. I conclude with a short discussion of the role that didactic philosophy might play in such an education, arguing that the unique value of the discipline rests not with its ability to allow the extended practice of thinking skills (Mulnix, 2012; Lipman, 2003; Winstanley, 2009), but as a space or forum where students

can test the boundaries of appropriate interrogation, iteratively questioning to the point where the legitimacy of the question is itself at issue.

1.4. A note on theoretical perspective

The eclectic approach that I have described may strike some as particularly odd. Indeed, the attempt to amalgamate phenomenological perspective with the publicly empirical constraints of neurocognitive theory requires some explanation, as the two approaches have long occupied diametrically opposed positions on the spectrum of theory of mind methods of inquiry (Wittgenstein, 2001; Dennett, 1991). However, in presenting a framework for understanding questioning that offers practical possibilities for improving the thinking of developing minds, I wish to make as few contentious ontological commitments as possible. As such, I make every effort to assume a common sense understanding of the world, one that I assume will be generally accepted by those responsible for developing and implementing educational programs, at least in the United States. This understanding acknowledges the primacy of a materially-based external world, a world knowable in large part through third-person scientific method. Yet it also acknowledges the legitimacy of first person perspective, treating phenomenal experience as data that needs to be explained rather than dismissed (Searle, 1997). In a technical sense, then, it would seem that my treatment of phenomenology is somewhat strained, for I explicitly reject the ontological commitment to phenomenal monism that traditionally accompanies philosophical phenomenology. That said, contemporary use of empirical phenomenology similarly engages the methodology while remaining ontologically neutral (Donalek, 2004; Dowling, 2007; Munhall, 2011; Dreyfus, 2002). Even central

figures of contemporary philosophical phenomenology have sought a mutually supportive integration with scientific theory and practice, particularly in the domain of theory of mind (Gallagher, 2010; Zahavi, 2010). If anything, it is not that the phenomenologists shun rapprochement with scientific theory, but rather that many cognitive scientists and philosophers of mind dismiss the value of first person perspective (Gallagher, 2010; Dennett, 1991; Dennett, 2001). That said, there are numerous examples of naturalized theories of mind that assume the primacy of explaining first person reports of phenomenal data (Damasio, 2012; Edelman, 2003; Searle, 1997; Dehaene, 2014). Put succinctly, there is no shortage of precedents for engaging an approach that blends the phenomenological with the scientifically empirical.⁴

⁴ I might add that absent my pragmatic intent to frame arguments on grounds acceptable to educationists, the assumption of scientific primacy could readily be reframed in the context of phenomenology - that is, as an abstraction of ontologically neutral phenomena.

Chapter 2: What is Everyday Criticality?

2.1. Defining criticality

Educational literature is rife with variants of the word “critical,” and the theoretical conceptions that underlie their use are diverse and sometimes antagonistic. From critical thinking to critical pedagogy, critical being, critical reading, and even criticality itself, the variety of educationally-relevant theoretical constructs referencing the word presents a challenge to crystalizing a shared understanding of what it means to be critical. We are told, for example, that critical thinking involves the search for “reasons on which to base... assessments, judgments, and actions” (Siegel, 1988, p. 33), that critical pedagogy seeks to “[draw] attention to questions concerning who has control over the conditions for the production of knowledge, values, and skills” (Giroux, 2013, p. 2), and that criticality requires that we transcend both critical thinking and critical pedagogy to think independently of any particular thinking framework (Burbules & Berk, 1999). In some cases, this diversity of meaning exists even within a single construct, with empirical studies on the subject of critical thinking displaying a surprising assortment of distinct conceptual articulations (Fisherman, 2013). Perhaps most confusing are cases where concepts in the critical “family” are presented without any further elaboration, as when the English and Language Arts Common Core Standards document references the term “critical” only to state that students who meet the Standards “habitually perform the critical reading necessary to pick through the staggering amount of information available today” (Craft & Ideas, 2010, p. 3) and “evaluate other points of view critically and constructively” (Craft & Ideas, 2010, p. 7).

Here, the reader is simply left to his or her own devices to understand how critical reading and critical evaluation differ from their “non-critical” counterparts.

It then makes sense to inquire into the “critical-ness” of these concepts. What is it that is particularly critical about critical pedagogy and critical thinking? What commonality does criticality hold with critical being and the various other “critical X” concepts that endows it with critical character? Unfortunately, reference to a dictionary definition of the word *critical* suffers from a number of issues that illustrate the ostensible difficulty of articulating such commonality. Defined by Webster’s as “exercising or involving careful judgment or judicious evaluation <critical thinking>,” the entry, which is explicitly tied to its critical thinking articulation, fails to capture the breadth of the concept even as elaborated by critical thinking theorists, who consider evaluation to be only one of several key components of critical thinking (Facione, 1990). And even had it accounted for these other components, the focus on evaluation would, I believe, fail to address the framework-independent thinking demanded by Burbules and Berk’s (1999) conception of criticality or the questioning of existing power relations at the core of critical pedagogy. Perhaps most troubling, though, is the definition’s reliance on the vague terms “careful” and “judicious.” For it is precisely these terms that need to be unpacked to gain the requisite measure of conceptual clarity.⁵

⁵ It is perhaps ironic that I should critique this definition of the term “critical,” for criticality as a form of judgment is precisely the main claim of this work. There is, however, an important difference between the dictionary definition and my core claim. Whereas the former articulates judgment as the aim or product of critique, the latter does not. Rather, as I make clear in the following paragraphs, critical acts are interrogative – they render questions instead of judgments. Judgment, on this account, serves a second-

Yet, I wish to suggest – or given the obviousness of the claim, simply emphasize - that there does exist a commonality of meaning among the family of “critical” concepts, one founded on the idea of interrogation or questioning. Indeed, what the various constructs share is an emphasis on the practice of questioning assertions and interrogating beliefs. Moreover, this practice is not only comprehensively shared - it permeates the core of each concept. Yes, each concept defines a critical process that entails more than questioning, from asserting the need to engage reflective evaluation to requiring an awakening to the nature of social power dynamics. But among the diversity of critical elaborations, interrogation is the *sine qua non* of critical activity, though it manifests in a variety of concept-specific ways.

Take, for example, the consensus definition of critical thinking offered by the 1990 Delphi Panel,⁶ a definition that makes no mention of questioning: “We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (Facione, 1990). This definition focuses on obtaining judgment through a variety of thinking activities - interpretation, analysis, evaluation, and inference - and substantiating the product of those activities with reasons. Nowhere in this summary

order role – whether to interrogate or refrain from interrogation. In clichéd terms, it thus serves as a necessary means rather than an end in itself.

⁶ The Delphi Panel was a United States government-sponsored commission of critical thinking experts given the task of articulating a consensus understanding of critical thinking.

definition do the authors make explicit an act of interrogation⁷. Yet it does not take much to recognize the core role that interrogation plays for each of these conceptual components. For example, that an individual engages interpretation to understand the meaning of a statement or experience requires that she has, at least implicitly, asked the question “What does this statement (or text, experience, etc.) mean?” Asking this question provides the necessary impetus to seek interpretation – we don’t know what the statement means, and are drawn to find out. In a stronger formulation, we might say that the act presupposes the question - that without an asking, there is no interpretive act.

The same can be said for the other thinking activities enumerated in the Delphi description. Analysis, at least implicitly, requires that we ask a question such as “What is the author’s main claim and how does she argue for it?” Evaluation presupposes something like “Is there good reason to believe this statement?” And inference entails a question like “What other statements follow?” In all these cases, though the particular act of thinking may not be triggered by an explicit act of questioning, engagement of the act entails a preliminary “asking.”

In a similar manner, questioning underlies both terms of Delphi’s succinct definition of critical thinking as “self-regulatory judgment.” First, that critical thinking is ultimately concerned with judgment suggests that a critical thinker engages critically to

⁷ However, the importance of questioning in the critical thinking process is highlighted rather explicitly in the extended discussion offered by the Delphi report, particularly as it concerns the critical dispositions of curiosity and inquisitiveness.

“decide what to believe or do” (Ennis, 2004). Such engagement is again tantamount to asking the question “what should I believe (or do)?”⁸ For in engaging critical thinking the individual maintains at least some practical doubt on the matter and seeks to resolve that doubt. It is here that interrogation serves perhaps its most central role in critical thinking, as it puts on the table the very possibility of engaging the critical thinking process. That is, the need for judgment is rendered moot without the question “what should I believe (or do)?” So again, engaging the acts that lead to judgment represents a question already asked.

Finally, questioning can be found at the core of the concept of self-regulation, or what has also been called self-correction (Lipman, 2003; Splitter & Sharp, 1995; Sharp, 1991) or meta-cognitive reflection (Lipman, 2003; Willingham, 2007). This signature aspect of critical thinking concerns the act of monitoring the quality of one’s thinking, for recognizing errors committed, assumptions made, or weak reasons offered in the process of the thinking. As such, this monitoring constitutes an ongoing act of self-interrogation, a reflective asking whether my inferences are valid and my claims justified. In a sense, self-regulation defines critical thinking as an iterative process where each step of potential progress made over the course of critical engagement is itself questioned. Seen this way, the Delphi definition of critical thinking is fundamentally characterized as an

⁸ Or in the case of existing beliefs or actions, critical thinking would imply the variant “Should I believe (or do) this?”

act of interrogation, as a potentially endless series of questions that serves to justify belief and action.

Though critical pedagogy lacks this concern for defining an abstract and comprehensive process of rational justification, it is no less concerned with the interrogation of claims. Rather than situate an emphasis on interrogation in the context of an abstract ideal of reasoned justification, critical pedagogy emphasizes the need to raise awareness of the social forces that influence, and even dictate, patterns of interrogative behavior (Freire, 1996; Freire, 2009; Giroux, 1983; McLaren & Hammer, 1989). As such, it seeks to “raise questions about inequalities of power... and about the way belief systems become internalized to the point where individuals and groups abandon the very aspiration to question or change their lot in life” (Burbules & Berk, 1999, p. 6). Here, interrogation does not directly serve our general judgment of what to believe or do. Rather, it forces reconsideration of particular beliefs – those that comprise our understanding of social power dynamics. In doing so, critical pedagogy seeks to “both affirm and render problematic the multiplicity of voices students bring with them into the classroom and transform them in the interest of social and cultural justice” (McLaren & Hammer, 1989, p. 40). In this sense, the field exhibits a more explicit, though no more fundamental, focus on questioning than critical thinking. Where questioning in critical thinking implicitly underwrites the general process of judgment, critical pedagogy explicitly moves to front and center the need to question beliefs about social power relations and their effect on the genesis of subjectivity, particularly as it concerns the development of critical disposition (Freire,

1996; Greene, 1988).⁹ As such, critical pedagogy emphasizes interrogation in two respects - first, by challenging existing socio-political belief structures to “illuminate[s] how knowledge, identities, and authority are constructed within particular sets of social relations” (Giroux, 2013, p. 1), and second, by harnessing such understanding to enable the individual’s tendency toward interrogation. Indeed, the logic of this dual focus is articulated by Maxine Greene, who argues that “if situations cannot be created that enable the young to deal with feelings of being manipulated by outside forces, there will be far too little sense of agency among them. Without a sense of agency, young people are unlikely to pose significant questions, the existentially rooted questions in which learning begins” (Greene, 2009, p. 139).¹⁰ Here, Greene’s prioritization of socio-political interrogation serves as an implicit criticism of the critical thinking movement by suggesting that social dynamics foreclose upon the possibility of asking fundamental questions. That is, in legitimizing the possibility of knowledge that transcends socio-cultural perspective, critical thinking fails to appreciate the cognitive - and specifically, interrogative - ramifications of one’s position in the world. Absent the awareness resulting from

⁹ Despite its focus on interrogation in the name of freedom and social justice, there have been those who have advocated that critical pedagogy ought to assume a broader view toward critical questioning. Biesta, for example, has argued that “the only consistent way for critical pedagogy to proceed...is by a perpetual challenge of all claims to authority *including the claims to authority of critical pedagogy itself*” (Biesta, Say you want a revolution... Suggestions for the impossible future of critical pedagogy, 1998, p. 505). Such a view, while itself a challenge to the traditional ethical ends of critical pedagogy, further exemplifies its commitment to interrogation. In essence, Biesta advocates that more than working in the name of social justice, critical pedagogy must be comprehensive in the interrogation of claims if it is to “live its ideal.” In this case, this ideal entails a challenge to the value of the domain itself.

¹⁰ See Giroux’s (Theory & resistance in education - A pedagogy for the opposition, 1983) elaboration of a “problematic” for another argument that articulates this logic.

interrogation of existing social power relations, critical thinking is thus itself insufficient for nurturing a critical spirit.

A related criticism is offered by Gerry Dunne (2015), whose elaboration of critical being offers yet another example of the centrality of interrogation to criticality. While critical pedagogy emphasizes the impact of social dynamics upon critical behavior, Dunne focuses on the influence of individual factors, critiquing critical thinking on the ground that it takes scant account of the particularity and embeddedness of the critical thinker. He claims that in establishing a norm intended to rigidly apply to every individual, critical thinking “irreducibly cognitivizes our very being and imposes an ends-focused problem-solving rubric to accomplish a satisfactory conclusion. In so doing, it extricates both the experiences, and the situationedness of the living agent from the reality she is experiencing. Put another way, it tries to separate the dancer from the dance” (Dunne, 2015, p. 94). Here Dunne suggests that it is difficult to accept an ideal of thinking that seeks to marginalize, or even ignore, the unique epistemic contributions of the individual. As such, he requires that we interrogate the primacy of rationality in critical thinking and acknowledge that cognitive engagement necessarily occurs in the context of a unique life history, individual preferences, and a set of personal goals. Referencing Barnett’s (1997) tripartite conception of criticality as critical/analytical thinking, critical self-reflection, and critical action, Dunne advocates that critical thinking be superseded by the more expansive concept of critical being that, at its core, accounts for the “unique set of epistemic criteria and standards” (Dunne, 2015, p. 94) that underwrite individual belief adoption, value judgment, and everyday action. In offering this conception, Dunne seeks

a critical ideal that transcends critical thinking both in scope and depth. Critical being is not just a type of objectively proscribed thinking, one committed to the dispassionate evaluation of claims and judgments. Instead, it encompasses both thinking and action in the context of reflective inquiry into an individual's personhood - their goals, affinities, dislikes, and behavior – in order to evaluate belief and action within the context of a lived experience. Ultimately, Dunne implies a relativity among justificatory criteria, where the foundational role of the individual necessitates rejection of a common epistemic standard to evaluate the adequacy of reasons demanded by a critical thinking ideal.

While Dunne's incorporation of personal epistemic considerations appears to be in direct conflict with the requirement that critical thinking be "universal and objective" (Siegel, 1988, p. 34) , an argument can be made that critical thinking provides accommodation for these conflicting elements. Dunne seems to target the characterization of critical thinking that is most often visible in the classroom, a formulaic process emphasizing the tenets of informal logic that is typically engaged only when reading school text, discussing current events, or engaging topics of common interest. But critical thinking theorists offer formulations that, by and large, seek to transcend such a narrow view of critical thinking. Indeed, one might argue that both Siegel's (1988) succinct but expansive articulation of critical thinking as a process of judging assertions on the strength of reasons and the Delphi Report's (Facione, 1990) notion of self-regulating judgment are broad enough to encompass Barnett's three components of critical being. And Richard Paul (1984) seems to explicitly address

Dunne's concerns about the ultimate relativity of epistemic criteria with an articulation of critical thinking that allows for reasoning based on individual "world view."

However, even if one takes the view that critical being articulates aspects of criticality that extend beyond the bounds of critical thinking, it is not difficult to see the common prioritization of interrogation. Specifically, inquiry into personhood again assumes the asking of questions – questions like "What are my goals, affinities, and dislikes?", "How do my actions align with these goals?", "Do I have good reason to believe X given my fundamental epistemic beliefs?" And this questioning forms a core aspect of Dunne's concept of critical being – there is no inquiry into personhood without asking such questions. As I have already argued, even if these questions are not explicitly formulated, the act of evaluating how actions align with goals or how potential or extant beliefs align with one's core worldview already presupposes an interrogative act.

Perhaps the most fundamentally interrogative elaboration of a "critical" concept can be found in Burbules and Berk's articulation of criticality. Burbules and Berk (1999) argue that the theoretical conflicts engaged by critical thinking and critical pedagogy proponents suggests the need to reassess our understanding of what it means to be critical. They claim that while critical thinking fails to acknowledge the influence of social factors on critical engagement, it is precisely this acknowledgement that renders critical pedagogy vulnerable to charges of ideology. Indeed, Burbules and Berk argue that claims to the exclusive sovereignty over what it means to be critical – claims offered by proponents of both critical thinking and critical pedagogy – suggest a critical

blindness toward to the inherent conceptual weaknesses of each critical concept. While they accept the necessary contributions each construct offers to an understanding of critical engagement, they add two interrelated conditions intended to overcome their opposing limitations. Both of these highlight the fundamentally interrogative nature of critical engagement.

First, Burbules and Berk argue that on a deep level, critical thinking requires “the ability to think outside a framework of conventional understandings; it means to think anew, *to think differently*” (Burbules & Berk, 1999, p. 8). More than other critical elaborations, this requirement highlights the iterative nature of critical questioning, explicitly linking criticality to the interrogation not only of one’s first-order beliefs, but of the epistemic criteria utilized in the process of rendering judgment. Criticality thus entails the interrogation of one’s own epistemic presuppositions and limits, “the ones without which we literally do not know how to think and act” (Burbules & Berk, 1999, p. 16). Second, they advocate the importance of viewing criticality as a social practice. According to this position, it is not sufficient to be capable of and predisposed to open-minded interrogation, as any existing thinking framework constrains the possibilities for thinking anew. Rather, one must proactively challenge existing belief by seeking out social situations where others present, advocate, and justify new ways of understanding the world. Here again, this requirement suggests the priority of interrogation over the ability to render specific judgment. Indeed, in claiming that the critical disposition requires that we hold our views “as perpetually open to challenge” (Burbules & Berk, 1999, p. 9), Burbules and Berk suggest that interrogation infuses the act of judgment itself. In a sense, the judgments of the critical thinker are

never fully assertive – they continue to exhibit a fundamentally interrogative quality that tempers every declarative posture.

While it is possible to extend this analysis to other conceptual constructs of the “critical” family, the four instances I have chosen would seem to make my point sufficiently clear – that despite the wide-ranging meaning and use of these concepts, there is a common emphasis on the need to interrogate. And this questioning, this fundamental subjecting to inquiry, lies at the core of our intuitive understanding of critical activity. To critique claim X is to subject X to evaluation, and such evaluation necessarily entails initial and ongoing acts of interrogation. “Is this statement true?” “Is this good music?” “Is this argument convincing?” “Should I break up with my boyfriend?” “These are the implicit interrogative analogs that initiate evaluations of their declarative counterparts. The various concepts of the “critical family” might specify different epistemic criteria for evaluation, but the act of evaluation itself entails a preliminary interrogative act. Perhaps more important, the evaluative component of critical behavior is itself infused with ongoing acts of interrogation, as it is the iterative questioning of interim judgments offered in the course of evaluation that uniquely characterizes our intuitive understanding of critical behavior. It is this iterative interrogation in the context of evaluation that best describes the commonality among the family of “critical” constructs, whether the target of such interrogation concerns our own beliefs, decisions, and judgments or those of others.

This common basis in interrogation, however, is readily overshadowed by differences in the epistemic criteria for evaluation, differences that often lead us to view

the various critical constructs as conflicting or antithetical. Thus, Dunne's elaboration of critical being is offered as a response to the shortcomings of critical thinking, to both validate the use of personal epistemic criteria and articulate the critical ideal as something that transcends thinking (Dunne, 2015). The same can be said for the bidirectional antagonism between advocates of critical thinking and critical pedagogy. Critical pedagogists view an understanding of power relations as a necessary component of claim assessment, arguing that the criteria for strength of justification are influenced by the dynamics of social embeddedness (Burbules & Berk, 1999). Critical thinking theorists counter that such a claim itself requires justification by reasons independent of social dynamics (Siegel, 1988). As a result, each group views the other as ideologically motivated and insufficiently critical, with the critical thinking camp arguing that the social dynamics criterion belies an uncritiqued worldview (Burbules & Berk, 1999), and the critical pedagogy camp claiming that the lack of a such a criterion unjustifiably restricts legitimate avenues of critical interrogation (Giroux, 1994). In focusing on the evaluative component, we are thus left with an understanding of the various critical concepts that masks their fundamental commonality.

We might therefore view each of the critical concepts as having both an assertive and an interrogative component, where the former accounts for the need to issue judgment, and the latter acts as the requisite critical "brake." Seen this way, the diversity of critical concepts reflects the differing, and often conflicting, articulations of the assertive component. The interrogative component, on the other hand, serves as taxonomic "glue," ushering each construct into the critical "family." This is why we can

view critical behavior as fundamentally interrogative. While each of the critical constructs might define different criteria for judgment, it is the iterative questioning of claims – both to initiate evaluation and as an integral part of the evaluation process – that characterizes the commonality of each of the various articulations critical behavior. It is this questioning, I suggest, that both distinguishes critical judgment from its non-critical counterparts and allows us to see each of the constructs as characteristically critical in the face of conflicting epistemic assumptions.

Such an emphasis on interrogation is perhaps best exemplified by John McPeck's succinct definition of critical thinking as "reflective skepticism" (McPeck, 1981), a concept having its roots in Dewey's articulation of critical thinking (Dewey, 1910). Yet I would suggest that even this phrase lacks the necessary nuance to properly describe the questioning at the core of critical behavior. Critical questioning entails an open-mindedness that extends beyond our everyday understanding of doubt and skepticism, which carry with them a connotation of a negation, a suggestion that the doubted claim is false. The interrogative element of critical behavior, however, is characterized by a distinct agnosticism, one that acts merely to "bring into play" the possibility of rejecting an assertion. In this case, there is a withholding of judgment that accompanies this prerequisite to evaluation. Where judgment concerns assertions of truth, interrogative agnosticism extends to whether the claim is even knowable, distinguishing it further from epistemological skepticism, which purports an inability to know the truth of any assertion. As such, we should not equate critical behavior with either doubt or skepticism

per se, but view it as open-minded questioning, a questioning that eschews any predilection toward specific judgment.

There is something more that we can glean from comparing the four critical concepts. While they each express the centrality of iterative interrogation, I have noted that three of them – critical pedagogy, critical being, and criticality – present critiques of critical thinking, with the latter two being offered as a response to its perceived shortcomings. These critiques bear a common refrain – that critical thinking fails to articulate the critical ideal because it neglects to require the critical thinker to interrogate their fundamental beliefs about the world, beliefs whose question-ability we fail to notice because they are central to our thinking and our understanding of the world. In elaborating a general and abstract process geared toward judgment, critical thinking focuses only broadly on the need to question assumptions. It makes no effort to distinguish the background assumptions that define the epistemic criteria for belief acquisition, planning, and decision making from the claims that depend on such assumptions. Without such a distinction and a corresponding demand to interrogate background assumptions, critical thinking all too readily allows the reasons that justify critical judgment to go uncritiqued. It thus presents as a type of thinking devoted more toward rendering judgment on already-asked questions and solving already-defined problems than searching for and identifying questionable claims¹¹. Critical pedagogy,

¹¹ Such a view is borne out in statements like those of Facione, who claims that “The disposition toward critical thinking is the consistent internal motivation to engage problems and make decisions by using thinking.” In speaking of engaging problems and making decisions, we are given a picture of critical thinking that focuses on the thinking that occurs after problems are identified and questions are asked.

critical being, and criticality, on the other hand, emphasize the need to question the truth of our most basic assumptions. Whether those assumptions concern the epistemic import of social relations (critical pedagogy), rationality and the self (Dunne's critical being), or the need to adhere to a thinking framework (Burbules and Berk's criticality), the three critical concepts require that the critical thinker question the beliefs that comprise her fundamental understanding of the world. Absent such interrogation, it would be difficult to view an individual as being critical.

Whether such a criticism is warranted is a further question. For critical thinking, at least in its mainstream formulations, does explicitly require that the critical thinker be disposed to questioning assumptions (see Facione, 1990; Ennis, 2004; Paul, 1984; Lipman, 2003). And without any additional restrictions, such a requirement would seem to apply to all assumptions regardless of their role in our belief structure. Indeed, I doubt that proponents of critical thinking would hesitate to claim that the demand to interrogate background truth claims is not already entailed by the requirement to question assumptions. Yet, in criticizing critical thinking along these lines, the other critical concepts highlight something specific and important about what it means to be critical – that in order to render critical judgment, we need to interrogate beliefs “all the way down.” It is not sufficient to simply reference an epistemic commitment to critically justify a belief, decision, or action – even when such commitment is accepted for its justificatory strength. Being critical demands that we interrogate beliefs to the point where we question the very background beliefs about the way the world works, those assumptions “without which we literally do not know how to think and act” (Burbules &

Berk, 1999, p. 16). To the degree that critical thinking atomizes critical behavior and ascribes the virtue of criticality to those who merely recognize thinking shortfalls and offer what are taken to be appropriate reasons for their judgments, it misses a deep and fundamental characteristic of the critical spirit – the characteristic of putting on the table those beliefs that comprise our most basic understanding of the world.

Precisely this point is emphasized in Richard Paul's distinction between strong and weak sense critical thinking. Like many other critical thinking theorists, Paul acknowledges a gap between critical thinking competence and the disposition to use those skills. However, he takes this gap one step further, distinguishing the ideal, or strong sense, critical thinker from weak sense thinkers who regularly engage critical thinking "moves" to defend their existing, yet unexamined, beliefs. For Paul, weak sense critical thinkers are not critical thinkers in the way that we expect or want them to be. They are, in his words, "sophistic," skilled at defending positions in which they are already invested, positions whose rejection would suggest the need to reevaluate fundamental beliefs about oneself and the world:

Those students who have already developed a goodly set of biased assumptions, stereotypes, egocentric and sociocentric beliefs, training in recognizing "bad" reasoning in "neutral" cases (or in the case of the "opposition") become more sophistic rather than less so, more skilled in "rationalizing" and intellectualizing" the biases they already have. They are then less rather than more likely to abandon them if at a later time they meet some one who questions them. Like the religious believer who studies "apologetics" they now have a variety of critical "moves" of which they can make use in defense of their a priori egocentric belief system. (Paul, 1984, p. 3)

Strong sense critical thinking – the type of critical thinking that constitutes the aim of Paul's teaching efforts - entails the interrogation of precisely this "a priori egocentric belief system." It focuses not on recognizing the inferential weaknesses of individual

arguments, but on unpacking the deeply held, and often unstated, beliefs about the world and self upon which such arguments rely. Paul states:

When we as humans analyze and evaluate arguments which are significant to us (this includes all arguments which if accepted would strengthen or weaken the beliefs to which we have committed ourselves in word or deed), we do so... in relationship to prior belief-commitments. The *best we can do* in moving toward increased objectivity is to bring to the surface the set of beliefs, assumptions, and inferences from the perspective of which our analysis is proceeding, and to see explicitly the dialectical nature of our task, the critical "moves" we might make at various points and the various possible "counter-moves" those moves might call forth (Paul, 1984, p. 4 - emphasis is mine).

Such a position reiterates the critique leveled against the standard formulation of critical thinking - that to the degree that we avoid “going all the way down,” we miss something essential to our understanding of what it means to be critical. It also hints at Burbules and Berk’s suggestion that we might even see criticality as a concept that transcends the need to render judgment. For in stating that “the best we can do in moving toward increased objectivity is to bring to the surface the set of beliefs, assumptions, and inferences from the perspective of which our analysis is proceeding,” Paul prioritizes the understanding that arises from deep interrogation over the ability to “find a winner” among alternative or conflicting positions. What we have is a critique of critical thinking from within, one that aligns well with those that seek to portray critical thinking as an insufficient articulation of what it is to be critical.

In what follows, I sometimes use the term “criticality” to reference this open-minded iterative interrogation of beliefs. The term turns the common and signature characteristic of critical behavior into an attribute that is neither limited to thinking nor

marked by conflicts over epistemic criteria. Thus, marveling at the criticality of Xavier's understanding of the Syrian refugee crisis is an acknowledgment of the critical quality of Xavier's specific behavior – his effort to ensure that he was not simply accepting as true both his own beliefs and others' claims about the situation. Similarly, in remarking upon the lack of criticality of a newspaper editorial that advocates the use of American military power in the Middle East, we highlight its failure to acknowledge the contestability of claims made about the state of the world. In both cases, criticality references the critical character of a particular act or event, where critical is understood to be inherently interrogative.

More often, however, I employ “criticality” to reference the critical character of an individual – that is, an individual's disposition to engage critical modes of being (i.e. thinking, understanding, and acting). Utilized in this way, the term exhibits a meaning similar to the Delphi group's “critical thinking disposition” (Facione, 1990; Facione & Facione, 1992; Facione, 2000) and Harvey Siegel's (Siegel, 1988) “critical spirit,” concepts that reference not the act of critical thinking, but the critical thinker. Thus, in the same way that “Adrian lacks a critical spirit” is taken as an assertion of a less-than-desirable character trait (Ennis, 1996; Facione, 2000), we might speak of “Sophie's natural criticality” as way to describe a valued tendency to question her beliefs, the beliefs of others, and the institutional truths that we encounter daily.¹² Criticality,

¹² As an aside, there is ongoing debate in the critical thinking community whether critical thinking disposition should be understood as constitutive of the individual (i.e. as a personal attribute) or merely as a tendency toward a specific type of behavior. When understood as constitutive, critical thinking disposition

however, differs from critical thinking disposition in both scope and depth. Where critical thinking disposition conceives of critical behavior as a type of thinking, one that utilizes defined critical thinking skills (interpretation, analysis, evaluation, synthesis, etc.) to come to judgment on all sorts of claims – not just epistemic claims, but aesthetic, ethical, pragmatic, etc. - criticality extends the reference of critical disposition beyond acts of thinking while limiting its concern to interrogation of belief. In acting as an umbrella term, criticality references the disposition to interrogate regardless of whether such interrogation occurs during conscious mentation, in dialogue with others, or, as Burbles and Berk would have it, as part of one's efforts to engage belief-challenging social experiences.

2.2. Everyday criticality and the concept of demand

Ultimately, though, as the heading of this section indicates, I am interested not in criticality per se, but in the more restricted concept of *everyday* criticality. Here, I might initially propose that the phrase concerns the disposition to interrogate assertions in everyday situations. Such an elaboration clearly suggests a distinction between everyday and non-everyday situations, and leaves us with two questions - what distinguishes an everyday situation from its non-everyday counterpart, and what value such a distinction brings to an understanding of criticality, particularly as it applies to education. Here we

is typically elaborated as a set of character traits (such as open-mindedness and systematicity) that causally predispose individuals to engage critical thinking. Such traits, while clearly tied to behavioral manifestation, maintain an ontological character independent of behavior, allowing for a description of the individual as having latent attributes – that is, attributes that may not manifest behavior in every opportunity for critical thinking engagement. I will revisit this issue in Chapter 2, but for further discussion, see Facione 2000 and Ennis 1996.

might look to the educationally relevant concepts of everyday mathematics and everyday literacy for some preliminary guidance. The introduction to “Literacy in Everyday Life,” (Kutner, et al., 2007) which reports the results from the 2003 National Assessment of Adult Literacy, begins with a detailed list of examples of everyday situations that require literacy of some sort:

Using written information is an important part of everyday life in the United States. Adults in most workplaces are surrounded by written information: health and safety postings, brochures describing their benefits, instruction manuals, memos, reports, and e-mail. Parents of school-aged children often receive written notices and forms from their children’s schools: field trip permission slips, flyers about parent meetings or parent-teacher conferences, descriptions of course offerings, and applications for determining eligibility for free lunches and subsidized medical care. Older adults receive mailings explaining their Social Security and Medicare benefits. The millions of adults who take medication encounter labels explaining dosages, timing for taking the medication, interactions with other medications or food, and possible side effects. Getting a driver’s license, registering to vote, and renting or purchasing a place to live all require reading and understanding written information. (p. 1)

Similarly, the document’s executive summary offers a succinct definition of everyday quantitative literacy, describing it as

the knowledge and skills needed to identify and perform computations using numbers that are embedded in printed materials. Examples include balancing a checkbook, figuring out a tip, completing an order form, and determining the amount of interest on a loan from an advertisement. (pp. iii-iv)

While it might be argued that the concept of everyday mathematics is not itself limited to the quantitative skills needed to competently engage printed materials, the varied enumeration of everyday situations in these two paragraphs suggest several essential

characteristics of “everydayness.” We might summarize these by stating that everyday situations are those regularly engaged by large segments of the population while navigating the world. Understanding health-postings, filling out applications, and following medication directions are commonly encountered requirements of successfully navigating the world regardless of one’s specific social, economic, and physical circumstances. The same can be said for everyday contexts that demand quantitative literacy – they tend to be common experiences encountered while coping with world. Inversely, situations that are rarely, or even just occasionally encountered, or are specific to an individual’s personal circumstances, would likely not be included in lists like the ones above. Instead, they exemplify what is meant by non-everyday situations.

By analogy, we might now understand everyday criticality as the disposition to interrogate beliefs in situations commonly and generally encountered in the course of navigating the world.¹³ Here, I intend – though obviously not exhaustively - situations where we are at the workplace water cooler, at a job interview, watching a presidential debate, shopping at the grocery, buying a car, or just walking down the street. In such environments, we almost always find ourselves engaged in some linguistic activity - either talking to friends and acquaintances, reading posted text of some sort, or overhearing the conversations of others. And what we regularly encounter is what we might term truth claims, statements that purport to describe the way the world is.

¹³ By “commonly and generally encountered” I mean “regularly encountered by the general population.”

“America is a bastion of freedom”; “We carry only the freshest meat”; “If you don’t do well in Algebra, you’ll end up working at Mc Donald’s”; “Those that can’t do, teach”; “Look at how successful Trump is”; even something as benign as “It’s a quarter mile to main street.” Statements like these are ubiquitous in everyday situations – we are surrounded by them to the degree that we find ourselves interacting with others. And I would suggest that such claims exert a pressure on us to see the world in a particular way.¹⁴ It is not simply that they express or entail assertions that, to varying degrees, are perceived to be widely accepted, endorsed by authority, or consistent with other core beliefs, though these factors are known to exert outsized influence on the process of belief acquisition (Lewandowsky, H., Seifert, Schwarz, & Cook, 2012).¹⁵ Rather, such statements also work in conjunction with each other to reinforce a web of implied assumptions, background claims about the structure and function of the world that provide higher-order statements the context required to make them semantically substantive (Wittgenstein, 1969). The frequency with which these claims are implied, the matter-of-factness of their implication, and ultimately their role in enabling meaningful discourse, all contribute to their power to influence what we believe. Everyday situations are filled with these statements, and thus become a primary context - perhaps *the* primary

¹⁴ This is a point emphasized by Heidegger (Being and time, 1962) and central to his elaboration of Dasein.

¹⁵ Indeed, in substantiating the influence of mere familiarity on belief acquisition Lewandowsky et al. present empirical data that suggests that public retractions often serve to *reinforce* the belief of patently false statements by “directly or indirectly repeat[ing] false information in order to correct it, thus further enhancing its familiarity” (Lewandowsky, H., Seifert, Schwarz, & Cook, 2012, p. 115).

context - for belief acquisition. As such, there is reason to explore the ramifications of critical engagement in these situations. Everyday criticality, as the disposition to critically confront such claims and their silent implications, serves to bring awareness to this context, and thus lend a measure of autonomy to the process of belief acquisition.

There is, however, a difference between articulating the characteristics of everyday situations that require criticality and offering a conceptualization of everyday criticality. Indeed, everyday literacy is viewed as a legitimate concept not because there exist commonly encountered situations that must be successfully managed, but because there exists a type of literacy – a definable set of literacy skills - that everyday situations demand. That these skills comprise a definable subset of the domain does not exclude the subset from use in non-everyday situations. But from an educational perspective, there is value to defining such subsets to the degree that a) they map reasonably well to the requirements of everyday activities, and b) successful management of such activities is a primary educational aim. By labeling these subsets, we better articulate and limit the types of skills students must master to meet stated pedagogical goals.

In the same way that everyday literacy defines a type of literacy, there is something educationally important about the specific disposition to interrogate in everyday situations. Such a disposition, I propose, labels a tendency to interrogate truth claims where there exists no demand or expectation to engage such behavior. In other words, I am suggesting that everyday situations are generally characterized by a lack of demand for, or expectation of, criticality. Certainly, that is not always the case. But the same can be said as it relates to everyday literacy, where the type of language used on a

billboard, for example, could require skills more appropriate to reading poetry or literature. The fact is, when shopping for groceries, speaking to a doctor about medical options, reading a newspaper article, or watching television, there is rarely any social or personal expectation to engage critical questioning. We are left to our own devices to interrogate claims as we see fit.

The same may, of course, be said for many non-everyday situations, as there is no stipulation that these must demand critical engagement. There is, however, a potentially demanding non-everyday situation that maintains outsized pedagogical relevance – the classroom. This is, again, not to say that all classroom-based situations are demanding situations. Yet, to the degree that classroom education seeks to nurture criticality by asking children to engage critically, the classroom is a paradigmatic non-everyday demanding situation. That is, in being asked to engage critically, whether in dialogue, writing, or assessment, students cannot avoid the demand for criticality, regardless of how they respond to such demand. Indeed, the challenge for an education committed to everyday criticality is to nurture non-demanded critical engagement in the demanding environment of the classroom.

To be clear, I am offering an analysis where the concept of everyday criticality is only *contingently* tied to our understanding of everyday contexts. There is no conceptual link between the two constructs, nothing inherent in situations commonly and generally encountered while managing daily life that necessarily qualifies them as non-demanding. Indeed, we can envision a cultural milieu where critical engagement is valued to the point that there is sufficient social and personal expectation to engage critically in everyday

situations. In this case, we might very well characterize such situations as being demanding, and there would be little reason to speak of non-demanding criticality as everyday criticality. As such, my conceptual articulation of “everyday criticality” is based on the empirical claim that everyday situations are generally non-demanding situations.¹⁶

From an educational perspective, it is this non-demanding character that is essential to the type of critical disposition we wish to nurture. While an intuitive understanding of everydayness as “general and common situations” might naturally suggest a disposition to raise pragmatic questions - questions such as whether to take the bus or the train, whether to take an umbrella, or whether to go to college – the object of critical interrogation needs to be broadened if we are to view criticality as requiring “deep” and iterative questioning. A definition of everydayness in terms of demand satisfies this condition, as it makes no claim to the types of questions we should be raising. And yet, demand does suggest an intuitively educational condition on critical disposition. That is, to the degree that development of critical disposition is an aim of education, it seems that educators would seek to nurture the tendency to be critical in situations where there is little perceived pressure or demand to do so. These situations, as I have argued, are paradigmatically (though contingently) everyday situations. That they

¹⁶ Why this link exists is an interesting question that offers fertile ground for further analysis. That said, it is not necessary for my argument, and thus falls outside the scope of the project.

are general and common certainly magnifies the value of non-demanded criticality, but the educational value of everydayness itself derives from the general lack of demand.

This attempt to link distinct critical tendencies to particular thinking contexts has precedence in the critical thinking literature. Perkins et al., in elaborating their dispositional theory of critical thinking, introduce the concept of thinking “in the wild,” which they define as thinking outside of the classroom (Perkins, Jay, & Tishman, 1993; Richhart, 2001; Perkins, Tishman, Richhart, Donis, & Andrade, 2000; Perkins & Salomon, 2012). From an educational perspective, this distinction is justified by the radically different conditions that characterize such thinking. As they state:

...the challenges of exercising one’s intelligence “in the wild” are strikingly different from those in such tame laboratory and testing situations. (cf. Hutchins, 1996). Everyday contexts present a wilderness of vaguely marked and ill-defined occasions for thoughtful engagement. Opportunities for investing one’s intelligence must be detected. When they are, whether to bother is often more a personal decision than a *compelling need*. In everyday life, people’s sensitivity to subtle occasions for thinking and their inclination to follow through would appear to be substantial influences on intellectual performance alongside their capabilities. (Perkins, Tishman, Richhart, Donis, & Andrade, 2000, p. 270, emphasis is my own)

To further support the value of the distinction, Perkins’s group offers empirical data that document decreased engagement with critical thinking opportunities in “out-of-classroom” simulations – that is, in contexts that approximate conditions “in the wild.” Interestingly, the difference between in-the-wild simulations and in-class situations concerns the lack or presence of prompts that encourage critical engagement. Where in-class situations ask students to critique text where thinking shortfalls have been underlined, out-of-classroom simulations request critique in the absence of such prompts.

This lack of prompting is intended to approximate the need for “sensitivity to [the] subtle occasions” for critical engagement that exist outside of the classroom. Not surprisingly, the data shows that absent these prompts, students often lack the requisite sensitivity to recognize opportunities to critically engage.

I will return in subsequent chapters to Perkins et al.’s dispositional theory of thinking and the importance of recognition to our understanding of criticality. At this point, though, it is important to note that Perkins’s prompts function to approximate what I have called a demanding situation, as students in these cases are not left on their own to determine the appropriate level of critical engagement. As Perkins notes, once individuals recognize an opportunity for critical engagement, classroom and assessment contexts provide a “compelling need” to follow through with critique – either the teacher has made the request, the student is being assessed, or the general expectations of the classroom environment encourage critical engagement. Regardless of the specific condition, the demand placed on the student provides external motivation to critically respond. Furthermore, demand affects the very sensitivity to critical opportunities discussed by Perkins. Demanding situations not only exert a pressure to follow-through on recognized thinking shortfalls, they encourage a more deliberate search for them. Perkins may speak of the “loud voice” of critical opportunities in the classroom (Perkins & Ritchhart, 2004, p. 352), but we also need to acknowledge the “sharper eyes” encouraged by the context in which that voice appears.

While Perkins’ elaboration of “in-the-wild” functions much in the same way as the concept of demand, there is a substantive reason for preferring demand - the two

concepts slice the world differently, and the latter cuts in a way that more appropriately categorizes the diversity of thinking contexts. Perkins's concept "hard-codes" the types of situations that appear on either side of the distinction – where the classroom appears on one side, all other contexts (i.e. outside the classroom) occupy the other. In contrast, demand avoids such hard-coding. In focusing on a tell-tale (though contingent) characteristic of everyday situations instead of the situations themselves, the concept appropriately acknowledges that some situations outside the classroom present opportunities in a loud voice and encourage sharper eyes. For surely there exist instances where individuals gather workplace colleagues to critically evaluate company research that they believe to be vulnerable to criticism. And it seems reasonable to believe that legal trials encourage a critical sensitivity and follow-through that rivals or exceeds those found in classrooms. Inversely, the concept of demand allows that there are times when classrooms do not compel critical follow-through or nurture recognition of critical opportunities. Put simply, there exists a gap between Perkins' articulation of "in-the-wild" and the "soft-voice" situations that are their educational priority – the two don't necessarily map well. Indeed, to the degree that our concern lies with the latter, it shouldn't matter whether those characteristics are present inside the classroom or out. It should only matter that they are present. Thus, nurturing the disposition to critically engage in non-demanding situations becomes the more appropriate way to state the pedagogical priority.

Chapter 3: Everyday Criticality as an Educational Aim

3.1. Potential limits of everyday criticality

In saying that everyday criticality serves to bring awareness, and thus some measure of autonomy, to the process of belief acquisition, I intend to make a virtue of the concept, to say that everyday criticality is something worthy of being nurtured and developed. Further, seen in the context of other educationally relevant critical concepts – specifically critical thinking and critical pedagogy – it is not difficult to view development of criticality as the purview of education. Indeed, as we will see in this chapter, there is good reason to believe that everyday criticality already exists as an educational aim.

And yet, the normative claim, the claim that designates everyday criticality an intellectual virtue, is not itself one that should be left uncritiqued. Despite its intuitive appeal, there are a number of considerations that bring into question the degree to which we should encourage unfettered critique of the status quo. To begin with, while part of the promise of such critique is to effect social change for the better, there is ample historical evidence to temper any such expectations. Indeed, any understanding of “change for the better” would itself seem to suggest the need for a particular world view, highlighting the circular nature of any such justification. As Mulnix (2012) notes, that we would require the product of critical interrogation to support a particular ethical standard would seem to invite an accusation of ideology antithetical to the espoused spirit of critical engagement. The point is echoed by Scheffler when he states that “a system of schooling that does not place the world in jeopardy in the process of teaching its students

is, accordingly, not providing them with an education” (Scheffler, 1995, p. 85). The point is that, unless we view criticality as an end in itself, there is little to guarantee that efforts to encourage it will yield social results aligned with our expectations.

Additional issues arise when we consider the limits of critical engagement. Here I think there is something to say both from the practical and theoretical perspectives, particularly as it concerns the question whether the critical ideal entails that we *can* question anything or whether we *should* question everything. As a practical matter, that everyday criticality is valued for its service to belief adoption and decision making presents a tension with its iterative nature. For the degree to which we engage iterative interrogation determines the extent to which we continue to withhold judgment. Thus, in order to judge and act we must accept a practical limit to the depth of interrogation – at some point the iterative questioning has to stop, and we must simply accept some statements without critique.¹⁷ In a similar manner, it is no small task to engage in constant questioning, notwithstanding the vigor with which young children continually ask “Why?” As educational neuroscientist Daniel Willingham notes:

consider what life would be like if you always strove to think outside the box. Suppose you approached every task afresh and tried to see all of its possibilities, even daily tasks like chopping an onion entering your office building, or buying a soft drink at lunch. The novelty might be fun for a while, but life would soon be exhausting. (Willingham, 2009, p. 8)

¹⁷ As Ann Sharp notes, “The human conditions often might require that we make a provisional commitment to one belief or one course of action because of the need to act, but this in no way means that the particular belief can be justified as absolute truth” (Sharp, 1991).

As Willingham describes it, the issue does not simply concern the depth of critical interrogation. Rather it extends to the range of events potentially subject to critical engagement – at some point, enlarging the scope further becomes onerous. Thus, not only do the demands of action and judgment restrict the extent to which we can interrogate a particular claim or experience, but they also suggest that it is necessary to circumscribe the scope of claims subjected to inquiry.

While these are practical considerations, theoretical limits to the depth of interrogation have also been proposed. Wittgenstein (1969), in particular, has argued that any belief structure – that is, any coherent set of epistemic claims - is founded upon propositions that are both unjustifiable and immune from doubt. He claims that statements such as “I am here,” or “I have two hands” express meanings whose negations are semantically sense-less, leaving us with assertions of which we are necessarily certain independent of any justification. Indeed, it is precisely because semantic certainty is a *logical* construct, one that depends solely on the lack of meaning of a proposition’s negation, that justification is irrelevant to certainties.¹⁸ And yet according to

¹⁸ Wittgenstein’s argument hinges on the distinction between making an epistemic mistake and simply being wrong. For Wittgenstein, one can be wrong about the truth of a proposition without having made a mistake about it. For to have the possibility of making a mistake, epistemic conditions must exist that would render a person capable of doing so – for example, conditions where the lighting was bad or the electron microscope malfunctioned. Absent such conditions, no mistake could be made – a person might be wrong to accept a certainty, but they would have not made a mistake. And it is precisely statements like “I have two hands,” stated in the context of seeing one’s hands in optimal conditions, for which such conditions do not exist. A person may be hallucinating, but hallucinations are not epistemic mistakes.

Wittgenstein’s argument is thus a commentary on the nature of knowledge. In requiring justification, knowledge claims are necessarily vulnerable to mistakes. As a result, assertions about which there can be no mistakes are not knowledge claims. That the truth value of a certainty derives solely from the sense-lessness of its negation obviates the need for justification, rendering the certainty immune to

Wittgenstein, these certainties comprise the “foundational” justification for knowledge claims, making our entire set of beliefs dependent on what might best be described as epistemic axioms. Iterative interrogation thus reaches a logically necessary end when justification references one or more certainties, as questioning such justification is tantamount to asking a semantically sense-less question. And it is clearly a requirement of critical engagement that we ask semantically substantive questions.

Much of what follows, both in subsequent chapters and at the end of this chapter, is an attempt to reconcile the value we place on educating for everyday criticality with the theoretical and practical limits that I have just introduced. As I have described it, there is an ostensible paradox at the core of criticality, one that juxtaposes the value of interrogation with both the need to act and nature of knowledge. Put simply, if questioning has to stop at some point because of practical and theoretical constraints, our judgments and actions must ultimately be founded on statements accepted without interrogation. Such is the proposed role of epistemic criteria, which offers a set of accepted standards to resolve inquiry in the face of justificatory limits (Lipman, 2003; Dunne, 2015). As we have seen, though, different constructs in the “critical” family utilize disparate and often conflicting epistemic criteria, leading us to further inquire which criteria ought to be adopted. Burbules and Berk have even argued that criticality itself demands that we engage such inquiry, going so far as to suggest that we explore the

mistakes. As such, certainties are oxymoronic not knowledge claims. Instead, they are the axioms upon which a knowledge structure is founded.

value of thinking outside any particular established framework. Indeed, in claiming that “multiple, unreconciled interpretations, by contrast, might yield other sorts of benefits,” (Burbules & Berk, 1999, p. 15) they propose that there is something inherently valuable – something inherently critical - about *not* coming to judgment, about simply arranging for intellectual “display” the possible answers to a question or problem. The same might be said about Paul’s articulation of strong sense critical thinking, which suggests the limits of adjudicating between worldviews.¹⁹ All this highlights the essential paradox inherent in the concept of criticality– that to render judgment, the critical process ultimately requires an act of “non-criticality” as a restraint on further interrogation.

As I hope to show, this paradox maintains deep ramifications for how we conceptualize and educate for everyday criticality, ramifications that I believe have been ignored by both the theoretical literature on critical disposition and education policy as it relates to developing the capacity for critical thinking. That such ramifications matter at all, though, assumes that everyday criticality either is, or should be, an educational priority. While my concern with everyday criticality may belie my personal normative stance, I prefer to argue for the empirical claim - that this value is generally held as a core aim of contemporary education in the United States. Given that such a claim might appear to some as highly contentious in light of the current focus on academic fundamentals and standardized testing, I want to make it clear that I am not arguing that

¹⁹ Siegel, in fact, criticizes Paul’s strong sense critical thinking on grounds that “we are left with a vicious form of relativism in which all ‘rational’ disputes boil down to unanalyzable differences in world view” (Siegel, 1988, p. 14)

the contemporary classroom is a model of open-minded iterative inquiry. However, I do want to suggest that education for everyday criticality is a widely-held priority in both popular and academic educational literature. While what follows is far from being a comprehensive review of the literature, the exemplars that I have chosen should serve to justify the viability of this claim.

3.2. Visions of everyday criticality as an aim of education

3.2.1. Popular visions. Though the call to educate for everyday criticality has traditionally found traction in academic literature, two recent books suggest that the issue has found its way into popular educational dialogue. In “A More Beautiful Question,” Warren Berger (2014) argues that a practice of asking the right questions is the key to personal and social improvement. As he states, “we can and should ask Why about career, family relationships, local community issues – anywhere we might encounter a situation that is ripe for change and improvement” (p. 30). Berger documents dozens of interviews with prominent individuals - people in academic, spiritual, business, and social domains – who attribute their success to critical disposition. In analyzing the commonalities that these individuals exhibit in their penchant for questioning, Berger develops a three-step process of inquiry to define and answer ambitious but actionable questions, questions such as “Why does a prosthetic foot have to be shaped like a human foot?” (p. 29), “Why is my father-in-law so difficult?” (p. 30), and “Why do I believe in God?” Berger calls these “Why?” questions “Beautiful Questions,” and suggests that their role in initiating personal, material, and social change endows them with exceptional character, a unique beauty in the domain of possible questions. To be clear, though, in

advocating the importance of asking “Why?” Berger is not suggesting that we seek out reasons for an already accepted belief - to ask why a prosthetic foot must assume the form of a human foot is not to accept the necessity of the situation. Rather, it is the job of the “Why?” question to engage the possibility of belief rejection – of *not* assuming that prosthetic feet must be fashioned in the shape of a human foot, or of reworking one’s beliefs about a father-in-law. It is this power for initiating inquiry, for putting on the table the possibility of rejecting the status quo, that makes “Why?” questions uniquely beautiful. Moreover, Berger is clear about the connection between beauty and success, as he attributes the success of the individuals he profiles to “their willingness to challenge assumptions and to believe that everything is subject to change – regardless of what conventional wisdom holds” (p. 94). In this sense, we might say that not only are “Why?” questions beautiful, but that there is a certain beauty inherent in the critical disposition itself.

While “Why?” questions define Berger’s first stage of inquiry, his second and third stages require that we ask “What if?” and “How?”. These questions, however, maintain a different role in the inquiry process than “Why?” questions. Whereas asking “Why?” invites the possibility of deconstructing one’s belief system, “What if?” and “How?” support a process of reconstruction. In asking “What if?” we lay on the table alternatives to the status quo. And when we ask “How?” we seek implementation, to find a way to replace the status quo with one of those alternatives. In this way, we might see Berger’s process along the same lines articulated by the various “critical” constructs I discussed earlier. Beautiful questions are questions of criticality, questions that affirm

the possibility of changing reality, whether that reality concerns the world, one's own belief system, or one's behavior. As such, they serve the same role as critical questioning in critical thinking, critical pedagogy, critical being, etc. "What if?" and "How?" questions, on the other hand, function to help answer a question, to resolve interrogation. Thus, such questions can be seen as being analogous to the epistemic criteria proposed by the various critical concepts.

While "A More Beautiful Question" addresses critical disposition as an educational issue that transcends schooling, Berger does explore the role that schools might play in nurturing criticality. As if to emphasize both the failures and possibilities of contemporary schooling in this regard, he rhetorically asks

...if we also acknowledge that the ability to question effectively is among the most important of the critical skills needed... this question naturally arises: What if our schools could train students to be better lifelong learners and better adapters to change, by enabling them to be better questioners? (p. 49)

He then proceeds to elaborate a critique of the current classroom environment, referencing education research that documents the progressive lack of opportunities for inquiry as students move from primary to secondary education, and quoting administrators and teachers who uniformly express the belief that classroom questioning continues to be the privilege of the teacher, mostly to check up on students instead of encouraging inquiry. Such questioning, Berger states is "apt to leave a student feeling 'exposed' rather than inspired" (p. 56), and thus functions to kill the natural inquisitiveness that young children bring to school. Among several academics, he quotes

Yale professor William Deresiewicz, who attributes students' failure to "ask big questions about values and meaning and purpose" (p. 67) to education's preoccupation with developing domain-specific technical expertise. On the hopeful side, Berger profiles Deborah Meier's Central Park East School, which he holds as a model of education for questioning that has also achieved success by traditional academic measures. He also discusses other models of inquiry-based education, including Brightworks and High Tech High, noting that in such schools, "the entire curriculum is based around big questions" (p. 54).

Tony Wagner takes a similar view of questioning in his 2012 book "Creating Innovators." As the title of the book suggests, Wagner holds the same concern as Berger for nurturing the capacity to enact change. And much like "A More Beautiful Question," "Creating Innovators" is a work of informal qualitative research, presenting an analysis of eight case studies that elaborate the commonalities in the education of both STEM and social innovators. Wagner's focus, though, differs from Berger's on two accounts. First, while Berger makes clear the impact of critical questioning on all aspects of life, Wagner explicitly ties his educational ideal to the development of innovators in the workplace, emphasizing the need for innovation in addressing the world's current and future problems. Second, rather than explicitly prioritize the role of interrogation in developing innovators, Wagner points to three broad pedagogical heuristics as the crux of his analysis, naming play, passion, and purpose as core elements of an education for innovation. He holds that these aims maintain a sequentially causal relation, where the openness of play fosters the growth of individual passion, which itself enables a sense of

life purpose as commitment to one's passion grows. Education for innovation requires a pedagogy that encourages the development of passion and purpose, and Wagner is clear that contemporary teaching and policy is often at odds with such goals.

Though Wagner's pedagogical imperatives are ostensibly defined by the "play, passion, and purpose" slogan, the value of critical questioning is a theme that permeates the entirety of "Creating Innovators." In describing the process of innovation, Wagner speaks of questioning in much the same way as Berger, stating that "questioning allows innovators to break out of the status quo and consider new possibilities" (p. 14). Here we have a link to Berger's "Why?" and "What if?" questions, where in both cases the former acts to interrogate reality as we currently understand it, while the latter serves to introduce alternatives. This need for critically questioning the status quo is reiterated throughout the book, as we are told, for example, that "...the innovator's skills described in this book...allow you to ask the right questions..." (p. 25), that "to innovate, you have to question the status quo – rebel in a sense" (pp. 178-179), and that "we have to suspend judgments about how things are supposed to be if we're going to develop the capacities of children to be innovators as adults" (p. 205). Indeed, there is little ambiguity about the educational demand to nurture critical engagement. Innovation requires interrogation, so education for innovation entails education for criticality.

I might note that there is a sense in which the slogan "play, passion, and purpose" suggests a distinction I have reiterated several times – the distinction between deconstructing and reconstructing belief structure. In addition to seeing play as a means of developing passion, Wagner touts it as an activity conducive to critical engagement,

one that allows even the youngest children to immerse themselves in the ramifications of alternate realities. As such, play can be viewed as a means of enabling deconstruction, as a way to nurture the disposition to reconsider our understanding of the world. Similarly, Wagner's "purpose" acts as a reconstructive impulse, one that works to realize alternate possibilities. These are, in fact, points that Wagner highlights in his case studies. In telling the story of Jamien Sills, for example, he describes a young boy whose play with basketball sneakers led him to develop a fascination for sneaker design as a young adult. While learning everything about the sneaker industry, Jamien began to question the necessity of the toxic production methods utilized by sneaker companies. According to Wagner, it was precisely this questioning that transformed Jamien's passion for sneakers into a purpose, one that has him on the brink of creating a company devoted to the non-toxic mass production of sneakers.

3.2.2. Academic visions. In academia, there exists a long and varied tradition of normative educational ideals that seek to nurture everyday criticality. The lineage can arguably be traced back to Socrates, whose pedagogy of iterative inquiry is both well documented by the Platonic dialogues and explicitly referenced by contemporary elaborations of education for criticality. Despite these common roots, contemporary normative educational visions value everyday criticality for a variety of reasons, many of which align everyday criticality with the other educational aims. In much the same way that Wagner emphasizes the need for criticality because of its role in fostering innovation, academic visions for education often ascribe an instrumental function to everyday criticality, seeing it as a requirement to achieving a broader aim. This is particularly the

case when it comes to visions that prioritize aspects of social justice. Thus, Martha Nussbaum's (2010) democratic education and Paolo Freire's (1996; 2009) liberatory education both advocate everyday criticality as a priority because of a theorized link between interrogation of the socioeconomic status quo and the development of more equitable social relations. Something similar might be said for educational visions that avoid explicitly social aims – for example, the thinking skills movement and Dewey's inquiry pedagogy - where everyday criticality is seen as an essential component of a program to improve personal judgment and action. This is not to suggest that these ideals fail to ascribe non-instrumental value to an education for everyday criticality. Indeed, authors like Freire and bell hooks (2009) speak of the phenomenologically transformative potential of criticality to impart a “pregnancy” to lived experience and a richer appreciation for everyday encounters. However, with the exception of perhaps Scheffler's (1995) concept of the educated person, the normative ideals I discuss below view the link between criticality and the character of lived experience as secondary to social and cognitive concerns.

Indeed, the list of authors advocating an education for criticality is long enough to require an abbreviated treatment in this section. Fortunately, Martha Nussbaum undertakes a task similar to mine, documenting the long tradition of the Socratic ideal in Western education. Thus, I will reference her work in *Not for Profit* (2010) as the base of my case, adding to the discussion an overview of number of authors who have continued this tradition more recently - Freire, Adorno, Scheffler, and Siegel. Others, like Gutman

(1987) and hooks (2009), could be included as well, though given the purpose of this section, the authors I have chosen should offer enough support for my core claim.

Not for Profit presents an impassioned warning about the trajectory of Western education, declaring it in danger of abandoning its inherently democratic emphasis on the humanities in the face of a single-minded push to maximize economic development. To this end, Nussbaum engages a detailed analysis of the essential components of the Western educational tradition, addressing why each is essential to the health of democratic society. Education for critical thinking, and in particular the iterative interrogation of Socratic pedagogy, is arguably the centerpiece of her analysis, and she both documents its place in the history of Western educational theory and offers her own argument for its value. In defending the claim that “[Socrates’s] ideal of critical questioning... is central to the theory and practice of liberal education in the Western tradition” (Nussbaum, 2010, p. 47), Nussbaum traces the development of an education for everyday criticality from its 18th century theoretical roots in Rousseau’s *Emile* and Pestalozzi’s *Leonard and Gertrude*, through the 19th century practice of Froebel and Alcott, and finally to its 20th century culmination in the writings and projects of Dewey. In each case, the emphasis on critical questioning and self-examination is portrayed as an antidote “to an education that formed students into pliant tools of traditional authority” (Nussbaum, 2010, p. 62) , an education that she declares “is bad for life in general, [and] is fatal for democracy, since democracies will not survive without alert and active citizens” (Nussbaum, 2010, p. 62).

In adding her voice to the critical tradition, Nussbaum offers three reasons for the importance of everyday criticality. Though these are framed in terms of the need for self-examination rather than criticality, her description of Socratic pedagogy as the critical questioning employed in the service of self-examination renders them applicable to criticality. To begin, Nussbaum claims that self-examination is required for individuals to articulate with sufficient clarity a set of goals needed to avoid irrelevant or counterproductive action. Indeed, she states that “Socratic examination does not guarantee a good set of goals, but it at least guarantees that goals pursued will be seen clearly in relation to one another, and crucial issues will not be missed by haste and inadvertence” (Nussbaum, 2010, pp. 49-50). She further notes that self-examination offers a bulwark against manipulation and demagoguery, facilitating a “culture of individual dissent” that counteracts our natural vulnerability to authoritarian subservience and peer pressure (Nussbaum, 2010, p. 54). Finally, she suggests that people who fail to engage critical self-examination often disrespect others. This, she claims, is particularly true and detrimental in the realm of political debate, which, when taken as a form of competitive sport, often fails to promote constructive dialogue and good collective decision-making. She suggests that such failings create the conditions for a failure of democratic life, presenting an opportunity for anti-democratic personalities and institutions to gain an influence of everyday life.

Nussbaum does not mention Theodor Adorno in *Not for Profit*, but her argument for an education for criticality is almost identical to the one Adorno offers in “Education After Auschwitz” (1998). Like Nussbaum, Adorno expresses the need for creating a

culture of dissent through self-examination, stating that “the single genuine power standing against the principle of Auschwitz is autonomy, if I might use the Kantian expression: the power of reflection of self-determination, of not cooperating” (Adorno, 1998, p. 4). And he believes that education offers perhaps the sole means of nurturing such a culture in light of the inherently barbaric tendencies of civilization. Yet for education to live up to the task, it needs to make self-examination its primary pedagogical aim, developing in children the critical faculties needed to bring to consciousness the forces that motivate personal behavior, particularly behavior that is cruel or barbaric. As he states, “One must labor against this lack of reflection, must dissuade people from striking outward without reflecting upon themselves. The only education that has any sense at all is an education toward critical self-reflection” (Adorno, 1998, p. 2). Critical self-reflection is thus the very activity advocated by Nussbaum – a self-examination through questioning that leads to better understanding of one’s self and relation to the world. Furthermore, Adorno hypothesizes the same effects of engaging this activity – the ability to think for oneself and a propensity to treat others with dignity and respect. Indeed, both authors employ similar language to articulate the role autonomous cognition in avoiding the worst behavioral tendencies of humans. Where Adorno speaks of the need to prevent another Auschwitz through “the power of reflection, self-determination, of non-cooperation,” Nussbaum states that “to prevent atrocities we need to counteract tendencies [toward authoritarian subservience and peer pressure], producing a culture of individual dissent” (Nussbaum, 2010, p. 54) .

Freire's liberatory education further expands the social and ethical dimensions of an education for criticality. Unlike Nussbaum and Adorno, who speak explicitly of educating children, Freire targets the education of the disenfranchised poor, particularly poor adults. And yet, his story is the same – education maintains a unique ability to address oppression and social injustice, but only if it embraces a pedagogy of criticality, where the disposition to critically interrogate one's understanding of world becomes the didactic focus. Consider what he states in *Pedagogy of the Oppressed*:

The revolutionary leaders must realize that their own conviction of the necessity for struggle... was not given to them by anyone else – if it is authentic.... Only the leaders' own involvement in reality, within an historical situation, led them to criticize this situation and to which to change it. Likewise, the oppressed... must reach this conviction as Subjects, not as objects. They also must intervene critically in the situation which surrounds them and whose mark they bear (Freire, 1996, p. 49).

Here, the foundation of social revolution rests not with the ability of leaders to mobilize the oppressed, but with the critical engagement of the masses. Perhaps more directly, but to the same effect, Freire states that “Those truly committed to liberation... must abandon the educational goal of deposit-making [of transmitting packaged knowledge] and replace it with the posing of the problems of human beings in their relations with the world” (Freire, 1996, p. 60). Yet Freire is clear – problems themselves cannot be packaged. It is not a matter of presenting them to the people, as a type of knowledge presented in the process of “deposit-making.” Rather, individuals must recognize problems on their own, even if it is the job of a teacher to facilitate that recognition: “the program content of the problem-posing method – dialogical par excellence - is constituted and organized by the

students' view of the world, where their own generative themes are found" (Freire, 1996, p. 90).

This need to generate one's own themes or "problems" is the foundation for an education for criticality. The teacher of the oppressed is not the authority on which students rely to articulate the parameters of a liberation struggle. Instead, the teacher acts in dialogue with students, engaging an interrogation of the world as perceived by the student. It is in this way that students begin to recognize problems in situations that previously seemed unproblematic. Freire explains:

That which had existed objectively but had not been perceived in its deeper implications (if indeed it was perceived at all) begins to "stand out," assuming the character of a problem and therefore of challenge. Thus, men and women begin to single out elements from the "background awareness" and to reflect upon them. These elements are now objects of their consideration, and, as such, objects of their action and cognition. (Freire, 1996, p. 90)

In this way, the dialogue inherent to a pedagogy for criticality maintains a transformative effect. It is not simply that students are made aware of problems, and thus understand the need for action. Rather, they engage an iterative, reflective process that develops their ability to recognize such problems in the context of their own lives.

While Nussbaum, Adorno, and Freire value criticality for its social and ethical import, Scheffler justifies it conceptually, as part of the very meaning of education.

Though Scheffler articulates a complex and multifaceted analysis of the educated person, he, like the others, gives center-stage to criticality. Indeed, in detailing the three core attributes of educated individuals - cognitive perspective, care, and conversation - he repeatedly references the need for, and disposition towards, critical intervention.

Consider the section on cognitive perspective, in which his discussion of explanatory principles concludes with the requirement that moral education nurture “the disposition to probe into the principles underlying the code of conduct to which one is attached by training” (Scheffler, 1995, p. 85). Here, moral education is defined not by the process of learning a code of conduct, but by the tendency to evaluate and rethink that code. The same idea resurfaces in the section on care, where Scheffler declares that “caring involves active participation in the forms of thought into which the person has been inducted, and such participation is the basis of critical modification of these forms themselves” (Scheffler, 1995, p. 87) . That Scheffler finds it necessary to single out “critical modification of a discipline” as an outcome of care when clearly there are numerous other relevant implications of caring participation suggests the value he ascribes to criticality. Criticality is referenced one final time in the section on conversation, with Scheffler arguing that education through dialogue nurtures a “sense of [him]self as a member of a critical community, responsible to general canons of evaluation to which his own beliefs and actions are subject...” (Scheffler, 1995, p. 89). Here again, Scheffler emphasizes the value of criticality. But this time, the relation concerns neither the ability nor the tendency to engage critically, as was the case with cognitive perspective and care, respectively. Instead, it concerns the thinker’s self-image as a critical being in community with others.

While these statements suggest that the three components gain their educative import from their ties to criticality, Scheffler offers one broad statement that cements the priority of criticality. He states:

My predecessor at Harvard, Robert Ulich, used to say that all education is a dangerous business. You had better be prepared for risks if you enter into education. John Dewey expressed the same point more generally when he remarked that every time you think, you place a piece of the world in jeopardy. A system of schooling that does not place the world in jeopardy in the process of teaching its students is, accordingly, not providing them with an education. (Scheffler, 1995, p. 85)

Here, we ought not mistake this statement as requiring that teachers merely present the world as questionable. In the same way that Freire's problem-posing pedagogy seeks to nurture a critical spirit, Scheffler's demand to "put the world in jeopardy" is a call to develop in students the tendency to critique and, indeed, rethink the foundations of our understanding – to enable students themselves to problematize the world. For, as noted by Dewey, it is when you *think* that you place the world in jeopardy. Such thinking simply *is* critical thinking – not in its dual manifestation of interrogation and assertion, but as an act of criticality, of entertaining the possibility that the world is other than is currently assumed. Of course, the full complement of assertive skills will have to come into play if such a possibility is evaluated. But the act of putting knowledge in jeopardy is, at its core, an act of interrogation.

3.3. Articulating an ideal of everyday criticality

Regardless of the particular vision, the fact that everyday criticality is held as an educational aim entails that we can articulate an ideal of everyday critical behavior that constitutes that aim. This would be the case with any educational aim, or even any aim in general, as the very idea of an aim requires that we articulate a target of our efforts. Such is the motivation behind existing elaborations of the ideal critical thinker (see Ennis, 1996; Facione, 1990; Facione, 2000; Siegel, 1988), where a description of one who is

open-minded, inquisitive, systematic, etc., defines at least some of the major objectives of an education for critical thinking. Absent such description, the aim is itself semantically empty, devoid of the detail necessary to understand what it is we seek to achieve.

Yet the mere mention of a critical ideal or standard is fraught with potential pitfalls. Perhaps most concerning is the question of who determines the standard, whose view of ideally appropriate questioning should constitute the norm. Can we say that born-again Christians fail to approximate the critical ideal to the degree of Darwinian evolutionists because they tend not to question their creationist beliefs? Or is it that their personal religious experiences have led them to develop epistemic criteria that render such questioning inappropriate, in the same way that others might consider inappropriate questions about the material existence of their dining room table. Dunne's emphasis on the need to consider personal epistemic criteria highlights precisely this criticism – that what we question depends, at least in part, on our fundamental epistemic commitments, on what we hold as appropriate justification for belief adoption. Wittgenstein (1969) offers a similar claim in stating that "...the questions that we raise and our doubts depend on the fact that some propositions are exempt from doubt" (p. 44). Such certainties, he claims, act as "methodological propositions" (p. 41) or "rules of testing" (p. 15) – that is, they form our epistemic criteria. And while it may be appealing to adopt the epistemic criteria articulated by science, the problem of justifying such criteria has long been acknowledged (see, for example Wittgenstein, 1969; Goodman, 1983; Kuhn, 2012). Without such justification, any drive to define a critical ideal is vulnerable to a claim of arbitrariness.

Note, too, that the concept of everydayness further threatens to undermine attempts at defining an ideal of everyday criticality. Here, the problem concerns the meaning of phrase “generally and commonly encountered” as well as the ontological assumptions it entails. As Ben Highmore notes, “Any assumption that it [everyday life] is simply ‘out there,’ as a palpable reality to be gathered up and described, should face an immediate question: whose everyday life?” (Highmore, 2002, p. 1). In defining everyday situations in terms of a generality that includes large swaths of a population, we run the risk of ignoring the life experiences of those omitted from that generality - the marginalized, the powerless, or the merely different. As Highmore emphasizes, such exclusion is tantamount to concretizing the contingent dominance of specific cultures to the point of excluding, or even dismissing, the “other.” Along similar lines, what counts as *commonly* encountered is also potentially up for debate. Are swims at the watering hole commonly encountered? Are evenings at a rock concert? Such questions naturally return us to the question of whose everyday life are we talking about. But even for those of us whose life includes such activities, are we justified in thinking of them as *commonly* encountered?

While these issues highlight potential difficulties defending an articulation of everyday criticality, the same problems exist for other concepts that reference everydayness. When we speak of everyday literacy or mathematics, we assume the existence of a family of situations requiring a definable set of skills. That such skills are the purview of formal schooling derives, at least in part, from a belief in their common and general need, from the perception that a large enough percentage of the population

frequently enough encounters situations whose successful navigation requires such skills. As such, there is a utilitarian element to educational talk of everydayness that justifies Highmore's basic criticism – in educating for the common and general, we necessarily exclude the uncommon and particular. But does such a criticism delegitimize efforts at promoting everyday literacy? If not, it would seem difficult to treat the concept of everyday criticality any differently, for the same utilitarian justification for teaching everyday literacy exists for invoking the concept of everyday criticality.

Furthermore, while there is an inherent ambiguity to everydayness when conceived as general and common situations, there exists a particular allure to committing to its conceptual “core.” Here, I might again reference Wittgenstein (2001), who describes the “concept of a concept” in terms of family resemblance. Where an articulation of sufficient and necessary conditions tends to have difficulty accounting for instances that reside at the boundaries of a domain, we can conceptualize a universal by recognizing a distinct web of resemblances among particulars. Like a rope whose tensile strength is generated without any one strand traversing the length of the rope, an understanding of everydayness derives from a web of similarity existing among the instances of everydayness that to a greater or lesser degree resemble each other without each resembling a definable universal. Here the boundaries of “general and common situations” might themselves be fuzzy, but we have little trouble recognizing core situations of everydayness. They have a resemblance to each other that rings out as being everyday.

Perhaps these conceptual difficulties are even less troubling when we conceive of everyday criticality in terms of demand. For in speaking of criticality in non-demanding situations, we remove the conceptual dependency on general and common situations. Indeed, there is no requirement that non-demanding situations be general and common - they just must lack the personal or social expectation to interrogate assertions. And I have suggested that this lack of demand is at the heart of the drive to educate for everyday criticality. While we, of course, desire that individuals act appropriately critical in all situations, there is a particular challenge to engage critical behavior in situations where people do not expect us to do so. Such was the upshot of the previous section, where I argued that popular, scholarly, and policy publications all emphasize that education ought to respond to this challenge. There are likely a number of reasons for valuing such a challenge, perhaps none more so than the belief that claims made in non-demanding situations bear an outsized influence on belief adoption. But that such situations are common and general is not itself what we perceive to be at issue – rather ubiquity simply magnifies the severity of the issue, helping to dictate the urgency of a response. What is at issue is that we value critical engagement when it is not demanded by the situation. And if we take this approach to articulating the educational imperative, the conceptual fuzziness of everyday criticality become less relevant and therefore less troubling.

There is an additional way to address this issue that helps articulate a context for the argument that I will develop in subsequent chapters. Regardless of any conceptual problems with “everydayness,” I have already offered the empirical claim that everyday

criticality is a core educational aim. As such, there appears to be a mainstream recognition of the legitimacy of speaking about everyday situations, for it would be difficult to hold an aim of everyday criticality while dismissing talk of everydayness. It is to this audience that my argument is directed. That is, I wish to point out that even when we acknowledge the value of educating for everyday criticality, there exist substantive problems with the way we understand and seek to nurture everyday criticality in the classroom. As such, one might say that I dismiss conceptual criticism of everyday criticality on technical grounds. Some people may express concern about the viability of everyday criticality - but given that I am already speaking to the choir, such concerns fall outside the scope of the current discourse.

Before moving on, let me summarize the argument I have offered up to this point. I have argued that, despite whatever disconnect exists between stated educational values and the reality of American schooling, everyday criticality is held as an aim of contemporary education in the United States. Given that every aim is defined by an ideal, it would seem that there must be an ideal of everyday criticality, a normative articulation of the disposition to interrogate assertions in non-demanding situations. However, I have made it a point to note that what is taken as questionable is, in part, a function of one's belief structure, which in acting to define an individual's epistemic criteria, endows beliefs with varying degrees of practical immunity from questioning. Finally, I have agreed with Wittgenstein and others that adjudicating between belief structures is ultimately not itself a matter of reasoned justification, rendering it impossible to ascribe priority to any particular set of epistemic criteria on purely rational

grounds. Justification begets a false demand for further justification, when in reality reasoning ends with unjustified assertions that, at best, maintain intuitive appeal.

In taking stock of these claims, it becomes particularly difficult to say what, as critical beings, we ought to be questioning. Again, are fundamentalists being any less critical than non-believers for not questioning the existence of a deity? Or are their core beliefs necessary epistemic prerequisites for a critical standard? Unless we accept the priority of a particular set of core beliefs, it would seem that we must entertain any number of specific ideals of critical disposition. So let us leave it as a possibility that there is a “locality” to the critical ideal, one that takes into account the differences in belief structures that arise from differences in culture, geography, technology, etc. In this case, we might resign ourselves to speaking of a localized, “small-s” standard of criticality.²⁰

That said, let me suggest that despite this possibility, the works and documents reviewed earlier suggest at least one basic normative commonality: that in educating for criticality, we seek to make individuals *more* critical. Even if we lack agreement as to what is legitimately questionable, we want students to question more, to be less prone to accepting assertions without evaluation. Implicit in this position is the belief that individuals do not meet the critical demands of the contemporary world, that they fail to

²⁰ Of course, the very idea of multiple standards is itself oxymoronic, and potentially begs the question “What is a standard, if there can be multiple of them?”

critically interrogate claims when they should. Perhaps Berger offers the most practical summary of this view when he states that

the more we're deluged with information, with 'facts' (which may or may not be), views, appeals, offers, and choices, then the more we must be able to sift and sort and decode and make sense of it all through rigorous inquiry. (Berger, 2014, pp. 25-26)

Often though, in what ostensibly sounds like standard language about the demands of critical thinking, we hear something a bit more extreme - an implicit suggestion to question everything. Thus, Dunne claims that "critical reason...insists on *tirelessly re-evaluating* and re-constructing institutionalized truth." (Dunne, 2015, p. 95). And Nieto and Valenzuela state that "once critical thinking has been deployed and has become the *normal way* of addressing problems and situations..." (Nieto & Valenzuela, 2012, p. 33). And Ikuonobe (2001) makes this suggestion explicit with an epistemological argument:

the fact that our knowledge is only highly probable (given human fallibilism) implies that there is a window of opportunity for one to be in error. Insofar as such a window exists, no matter how small, we should be committed to questioning and critically exploring it. (Ikuonobe, 2001, p. 329)

Even Harvey Siegel (1988), who seeks to counter this view, ends up offering backhanded support. In arguing that we should not be "moved solely and slavishly by devotion to reasons" (p. 133), and that "it makes perfect sense to... ignore the demands of reason in some circumstances" (p. 133), Siegel concludes that we should be "critical about being

critical” (p. 133).²¹ That is, he allows that we might be able to assume a non-critical attitude in situations, but only after we have critically accepted the “meta-reasons for ignoring object-level reasons” (p. 133). Thus, we might abandon interrogation if, for example, we critically determine that we play piano better when we prioritize intuition, or have a better chance to survive battle by mindlessly reacting to events. While such a position does allow individuals to assume a non-critical attitude, it has the odd effect of furthering the scope of criticality. For in Siegel’s normative vision, restraint from critical interrogation becomes acceptable only when it is mandated by critical interrogation. That is, even our moments of uncritical behavior require the blessings of criticality.

I might also note that the “leeway” to be uncritical that Siegel grants is perhaps only marginally different than the mainstream critical thinking attitude toward belief adoption, which allows beliefs to be accepted after critical interrogation²². In both cases, we are allowed a measure of non-criticality after critical interrogation where the degree to which we can accept an assertion after critique is the degree to which we engage in the same sort of restraint from critical thinking that Siegel finds acceptable. And since Siegel clearly does not consider critical belief adoption to be indicative of a lack of critical thinking, the same should be the case for Siegel’s intentionally non-critical behavior.

²¹ Siegel speaks of critical disposition in terms of providing reasons rather than interrogation. That said, there is no way to see the search for reasons without assuming interrogation. Indeed, such a search inherently involves interrogation.

²² Such an attitude is common to just about all formulations of critical thinking, and generally follows from Ennis’s stipulation that critical thinking concerns what to believe and do.

That both justify a measure of restraint from criticality by reference to criticality itself suggests that there is something wrong in characterizing one as an example of continued criticality and the other as illustrative of non-criticality.²³

What is to be said of this call for more critical engagement? On first glance, there would seem to be little reason to disagree with it. Indeed, I have little problem with the claim that individuals should be more critical. But there is a difference in accepting this claim and saying that more critical engagement constitutes the ideal of criticality. To say that people generally need to be more critical entails a comparison between the current “state” of critical expression and our ideal. It implies that if the ideal were realized, individuals would be more critical than they currently are. But it does not entail that the ideal of criticality is itself defined as more criticality. Rather, it entails only that the byproduct of realizing the ideal, whatever that may be, ought to be more critical behavior than currently exists. In fact, I am not sure that a critical ideal based on “more” is semantically specific enough to be considered much of an ideal at all, as its implied comparison – “more than what?” – merely specifies meeting some minimum quantitative baseline of criticality.

²³ One might see this as a poor analogy, arguing that critical belief adoption requires that beliefs be held tentatively and always subject to further critical inquiry. While I have no problem with this attitude toward belief adoption, I think the same can be said for being critical about being critical. That is, the need to be critical does not end once we have critically allowed a measure of non-criticality. For in the same way that we need to be alert to reasons for abandoning or modifying a belief, we must be alert to changes of context that require us to resume a critical attitude. In both cases, we still need a measure of criticality in the context of a non-critical attitude so that we might know when to switch gears.

Perhaps the ideal is simply that more questioning is always preferred. In this case, ideal criticality would not be characterized as a baseline, or a point on a vector of increasing criticality, but as an approximation to a limit case, to use a mathematical metaphor. Such an ideal is tantamount to the suggestion that we question everything - that, as Ikuonobe advocates, we commit to interrogating our knowledge claims no matter how small the window for epistemic error. Taken literally, and as a position to be applied to individual interrogation, this view is almost certainly untenable. Indeed, what would life be like to approach the world in such a manner, to continually and iteratively question what one should believe and do? Dunne (2015) offers a common description of a critical ideal that, in some sense, provides a rhetorical answer to this question. He states:

Education needs to empower students to interrogate the established epistemic norms (status quo) of the world around them. But they can only do this if they are epistemically literate. Epistemic literacy teaches students to scrutinize *all* knowledge claims and avoid the pitfalls of institutionalized or immutable truths. Epistemically literate students approach the world with the fervor of a reflective skeptic. With *each* knowledge claim, they ask themselves: does this convince me? Are the reasons this person believes X and Y to be the case sufficiently cogent reasons? Am I sufficiently moved by these reasons? Has this person appropriately justified their position? And finally, what are the limits of this person's knowledge claims? (p. 32, emphasis is mine)

While Dunne certainly articulates a critical ideal – and arguably a mainstream one at that - it is not one that we can possibly hope to approximate. Rather, it is an ideal proposed in a vacuum – one that ignores our relation to, and our embeddedness in, the world. Is this really how we want to educate students, to have them seek answers to these questions for *all* knowledge claims, to have them exhibit the “fervor of a reflective skeptic?” If so,

how could we act in a timely manner? And even if we could, is this how we should value our time? William James offers a more graphic elaboration of this point:

There is no more miserable human being than one in whom nothing is habitual but indecision, and for whom the lighting of every cigar, the drinking of every cup, the time of rising and going to bed every day, and the beginning of every bit of work are subjects of express volitional deliberation. Full half the time of such a man goes to the deciding or regretting of matters which ought to be so ingrained in him as practically not to exist for his consciousness at all. If there be such daily duties not yet ingrained in any one of my hearers, let him begin this very hour to set the matter right. (James, 1925, p. 32)

Here, James's reiterates my earlier claim that there exists conceptual tension between the process of iterative interrogation and its value in service of action, where the degree to which one engages critically is the degree to which one postpones action. Taken to an extreme, this tension promises to hinder action to a point where it is no longer reasonable to value criticality, since criticality is useful only to the degree that it facilitates acting in the world. As a result, we might interpret the call for more criticality as a value claim contingent on the current state of affairs, one that would not be made if the typical degree of critical engagement were such that increased critical disposition proved to be overly inhibiting and onerous.

All this suggests that while a critical norm in the here and now should justify a call for more criticality, it should not itself specify more criticality as part of the norm. Rather, given that we must limit both the scope and depth of iterative interrogation, an ideal of everyday criticality should speak of *appropriate* interrogation – and it should suggest heuristics for *better* questioning. Stated differently, the fact that we seek to nurture further, but not limitless, critical engagement implies a critical ideal founded

upon the concept of appropriate engagement. We want individuals to question things that they currently accept uncritically, yet we do not want them to be so critically predisposed that the mere act of waking up in the morning effects debilitating cognitive dissonance. Given that every moment and every experience presents an opportunity for critical engagement, it becomes the imperative of an ideal to specify – at least in a broad manner - which opportunities ought to be engaged and which should be ignored if everyday criticality is to serve practical judgment and action.

No doubt the specifics of such an ideal presents all sorts of practical difficulties. Who determines what is appropriate questioning, how we deal with conflicting visions of critical appropriateness, and how we evaluate critical engagement that proved appropriate or inappropriate only after the fact, all present a challenge to defining a specific ideal. Indeed, I have already allowed that we might abandon the hope for a universal Standard in favor of any number of shared local standards. However, none of these issues detract from the argument that I have offered. *What* is determined to be critically appropriate may be at issue, but *that* the ideal of everyday criticality is defined by reference to appropriateness is not. For in this case the *that* is not dependent on the *what*. Rather, it derives from the simple claim individuals ought to question additional, but not all, assertions.

While I have claimed that normative articulations of critical disposition tend to emphasize *more* critical questioning, there are those that explicitly acknowledge the need for restraint. In affirming that criticality ultimately serves action, Ritchhart, for example, states that “of course, one still must employ some judgment in the application of a

thinking disposition - one doesn't want students to be so open that they can never make a decision” (Richhart, 2001, p. 9). Similarly, Roth critiques the glorification of unbridled questioning in the humanities, claiming that it creates “a cultural climate that has little tolerance for finding or making meaning, whose intellectuals and cultural commentators delight in being able to show that somebody else is not to be believed” (Roth, 2010).

And Berger follows suit more colloquially, stating that “...if you don’t stop asking why at some reasonable point, you may end up, like Louis C.K. in his “Why?” comedy bit, lost in cosmic questions about why the universe is the way it is” (Berger, 2014, p. 94). Indeed, Berger comes close to advocating for appropriate questioning, as he not only emphasizes a limit to questioning, but speaks repeatedly of the need to ask the *right* questions. The same might be said for Perkins et al., who declare that “The concept of intelligence is a normative concept of mind because it expresses a view of what counts as good, or effective, cognition” (Perkins, Tishman, Richhart, Donis, & Andrade, 2000, p. 272). While this statement lacks any direct reference to criticality, it is made in the context of emphasizing the role of critical disposition in a theory of intelligence. As such, it is a short leap to seeing appropriate questioning as a subset of “good, or effective, cognition.”

I should note that there is a distinct difference between asking appropriate questions and asking the right questions, at least given the way Berger defines the latter. When Berger speaks of right questions, he takes what I would call a “backward-looking” approach, where the determination of “rightness” requires hindsight. Here, the “rightness” of a question depends on outcome, on how the results of asking the question

compare with one's articulated goals. So, for those working on a defined problem, a right question might be one that leads to a solution while a clearly "not-right" question might be one that promotes stagnation or further obfuscation. In either case, we evaluate the "rightness" of a question only by looking back at its asking, after we can assess its impact.

A determination of appropriateness, however, is independent of actual outcome. Instead, appropriate questions are those which we have good reason to ask.²⁴ Perhaps we recognize that a friend's assertion contradicts a previously offered claim, or that we are not sure that the person whose argument we are entertaining has provided sufficient evidence for a strongly held belief. In either case, the outcome of interrogating the assertion is irrelevant to the appropriateness of the interrogation. Appropriateness demands only that we be reasonably justified in asking the question.²⁵ Note, however, that in emphasizing the need for reasonable justification, we do not fully divorce appropriateness from outcome. For there is a perceived coupling between reason and outcome, where we hold that justified questions tend to produce desired outcomes with

²⁴ Again, I do not intend to minimize the issues created by invoking the idea of "good reason." However, I want to reiterate that regardless of the difficulties involved, the existence of a critical standard derives from our intuitive understanding of the bounds of a standard, where the lower bound specifies that individuals seek to be more critical than they generally are, and the upper bound requires that they not question everything. It is my claim that the existence of these bounds necessitates a view of criticality based on appropriate questioning. Again, this is not to say that there is a unified belief in the criteria of appropriate questioning. Indeed, it allows that different subsets of a population hold potentially radically different standards. But it does entail that, in educating for criticality, we bring to the table some particular understanding of what it means to question appropriately.

²⁵ Of course, the whole idea of reasonable justification involves the imposition of a standard, and it is precisely this standard that underwrites the notion of appropriateness.

greater frequency than unjustified questions. Indeed, I would suggest that this belief establishes the bedrock for understanding criticality as appropriate questioning – appropriate questioning is what we have reason to question, and we believe that justified questions are the ones we should ask in order to determine what to believe and do.²⁶

But in tying appropriate questioning to justification, we again face the paradox inherent in criticality. If appropriate questioning entails that we have good reason for asking a question, criticality would further require that we ask if it is appropriate to question our reasons. And inversely, if we refrain from interrogation in cases where someone suggested that there was good reason to do so, we might ask why such a reason was a good reason. The point here is that, in speaking of appropriate questioning, we always rely on a standard that itself could be questioned “all the way down” to base commitments:

“You should have questioned A.”

“Why? It seemed that A was clearly true.”

“Because B.”

“But it seems that B is a bad reason.”

“No. Here’s why B is a good reason...”

²⁶ I might note here that, in speaking of appropriateness in terms of reasons, to some degree, I am committing to Siegel’s (1988) reasons conception of critical thinking. As I see it, Siegel offers an attractive and defensible conception of the assertive aspect of critical thinking – that is, the appropriate use of reasons defines the essence of critically-founded assertions. And, as we will see, he invokes reasons to ground its interrogative aspect as well. However, I will argue, that his *use* of reasons in this respect does not justify a view of appropriate interrogation. Reasons do offer a foundation for an ideal of appropriate questioning, but not because individuals should have to engage in explicit reason assessment, as Siegel suggests. They do so because they manifest in perception.

This, of course, begins a vicious cycle of theoretically endless critical engagement, one whose resolution injects an “a-critical” element at the base of criticality.²⁷ For clearly, we do not expect exemplars of criticality to engage an endless cycle of questioning to determine the appropriateness of their reasons. Nor do we demand that they question everything. Such questioning, as I have stated previously, hardly meets our intuitive requirements for an ideal of criticality in service of judgment and action, regardless of the tacit influence of our deeply held beliefs. Rather, we admit that to the degree that such questioning happens at all, it ends because of pragmatic constraints.

So where does this leave us? I have argued that the educational aim of everyday criticality requires an ideal of justified questioning ultimately founded upon unjustified claims. As paradoxical as this seems, I believe it brings with it the possibility of seeing everyday critical disposition in a new light. In subsequent chapters, I would like to explore this possibility. Specifically, are existing articulations of critical disposition consistent with an ideal of appropriate questioning? Or do the claims made by theorists about the psychology and nature of critical disposition make it unlikely, if not impossible, to approximate the ideal? If that is the case, can we reconceptualize everyday critical disposition to account for the constraints imposed by appropriate questioning? To the

²⁷ This point is echoed by Ennis when he states “there are some basic judgments (such as judgments about a basic principle) that cannot conform to principle on risk of infinite regress or circularity” (Ennis R. , *Critical thinking dispositions: Their nature and assessability*, 1996, p. 169).

degree that we hold the ideal dear, particularly as an educational aim, it would seem that we must – that the ideal demands a conceptual articulation of everyday criticality consistent with, and supportive of, the ideal.²⁸ Indeed, I would think that the failure to offer any such articulation provides grounds to abandon the ideal.

Put simply, I am suggesting we utilize the normative sense of everyday critical disposition to further our descriptive understanding of the concept. This may seem like a strange way to approach the issue, as one would think that understanding should be held as a prerequisite to developing an ideal. Yet as we will see in the next chapter, there is substantial disagreement about the nature of critical disposition, and the various articulations that have been offered present conceptual difficulties that make them difficult to accept. It would thus seem that we cannot start from an understanding of criticality as we do not have one. On the other hand, by taking this “ideal-first” approach, I am suggesting that our understanding of criticality is, to some extent, already wrapped up in the ideal – that the ideal, itself, opens a window onto the nature of everyday criticality by establishing certain constraints that any conceptualization must satisfy. This, of course, does not imply that conceptualizations well-aligned with the ideal must be accepted. Rather, the ideal acts as a sort of litmus test to screen out those

²⁸ Consistency would seem to be a clear requirement, for how could we accept a conception of criticality that contradicts the tenets of the ideal to which we are committed? Support for the ideal is perhaps a more nebulous, but I think, no less important condition. By support, I mean justification – some reason to think - that individuals can attain or approximate the ideal. I address these requirements in greater deal in the next chapter.

that fail to support an ideal of appropriate questioning. Further evidence is then required to adjudicate among elaborations that satisfy the screen.

Chapter 4: Two Conceptions of Critical Disposition

4.1. Introduction

As I have defined it, everyday criticality is the disposition to interrogate belief claims in situations where there is little demand to do so. Yet, as specific as this definition may seem, it leaves undefined an understanding of both the general nature of dispositions, and the specific character of the disposition to interrogate. If the ideal I have laid out in the previous chapter is at all justifiable, though, there ought to be much to say about both topics. For while I think it reasonable to utilize our intuitions about an ideal to help us unpack a concept, an inability to articulate the dimensions and detail of a concept renders its corresponding ideal arbitrary and potentially unreasonable. That was precisely my point in previously critiquing the call to question everything – the ideal conflicts with our understanding of an important aspect of criticality, specifically the purpose that it serves. Ideals cannot be offered without regard to the conditions that enable or prevent their realization, and the concept or concepts that underlie the ideal are a primary source of such conditions. As such, we might reasonably require an elaboration of what it means to have a disposition to interrogate.

Much has been written on the nature of dispositions, as the issue has long been a staple philosophical discourse with regard to both subjects and objects (Ryle, 1949; Dewey, 2007). Elaborations of *critical* disposition have been a primary focus of theoretical discourse as well, particularly within the critical thinking movement over the past 35 years (see e.g., Facione, 1990; Ennis, 1996; Siegel, 1988; Facione, 2000). That said, it is important to distinguish criticality from the more broadly defined concept of

critical disposition. Where critical disposition has been traditionally conceived as the disposition to engage critical thinking – both its assertive and interrogative sides - criticality concerns the more narrowly defined disposition to interrogate. The concepts of curiosity and inquisitiveness are often referenced to elaborate the interrogative aspect of critical disposition, but numerous additional dispositional traits are included that ostensibly concern the assertive aspect - components such as systematicity, judiciousness, and confidence in reasoning. And while there is a substantial literature that elaborates critical thinking disposition in terms of such components (e.g. Ennis, 2004; Facione, 2000; Costa, 2001), there has been little focus specifically on the disposition to interrogate. As such, we must look to existing conceptions of critical disposition to get a sense of how we might further understand the concept of criticality. Such an approach, while not ideal, might be justified by the strong relation between the two concepts. Indeed, in the same manner that I previously argued that the critical act is fundamentally interrogative, I would suggest that we cannot understand the disposition to render critical judgment without acknowledging the role of the interrogative disposition. That is, to the degree that critical disposition is a disposition to engage acts of critical interpretation, analysis, evaluation, etc., the fact that such acts are themselves fundamentally interrogative renders critical disposition a type of disposition to interrogate, even when prioritizing its assertive component.

In this chapter, I analyze two widely disseminated conceptions of critical disposition – the motivation conception and the sensitivity conception - to determine whether either of them is consistent with, and indeed supports, an ideal of appropriate

questioning. As I have previously argued, if we are committed to such an ideal, any viable understanding of criticality must provide a basis for it. Stated in the contrapositive, the degree to which a conception of critical disposition fails to suggest and justify an ideal of appropriate interrogation implies that we must look elsewhere for an understanding of criticality. And indeed, this is what we will find. Rather than provide reason to support an ideal of appropriate interrogation, I shall claim that each of the two conceptions imply only the ideal of “more” questioning, and that their general acceptance can be explained as a product of the confusion between the contingent claim for more questioning - i.e. more questioning in the here and now - and an *ideal* of more questioning. Such claims set the stage for the subsequent two chapters, where I elaborate an “expertise” conception of everyday criticality, and explore its potential neurophysiological underpinnings.

4.2. Constraints on the concept of disposition

Perhaps we might consider it relatively unproblematic to describe a disposition as a tendency to behave in a particular manner, as when we say that glass has the disposition to shatter simply because that is how it often behaves. But this criterion highlights a theoretical issue that has long plagued attempts to articulate the nature of dispositions, leaving us to wonder if we can say anything more specific about it (Ryle, 1949; Ennis, 1996). We might call this problem the ontology of counterfactuals. As an object attribute that specifies only a tendency toward behavior, a disposition need not manifest as an actual state of affairs (Heil, 2005). Indeed, that an object exists in the counterfactual state – that is, in a state where the dispositional behavior is unactualized –

would seem to be a necessary condition for the disposition to be understood as only a *tendency* toward behavior and not as a rigid and inevitable response to a particular context or situation. And yet, this inherently episodic character of dispositions makes it difficult to conceptualize them as object attributes transcending the behavior itself, for we ostensibly cannot point to anything independent of the behavior that the object *has* that could itself be called the disposition (Heil, 2005). We are presented only with an object that either exhibits particular behavior or does not exhibit it. As Robert Ennis states, “dispositions are not revealed by inspection” (Ennis, 1996, p. 166).

That disposition might be best conceived as descriptive abstraction of object behavior is made all the more viable if we recognize that behavior – and hence, the tendency to behave - is a product not only of the object itself, but of the context in which the object is situated (McKittrick, 2003). It would be difficult to say, for instance, that glass has a disposition to shatter in an environment with a temperature only slightly below its melting point. Similarly, we might note that very small pieces of glass tend not to shatter unless subject to forces concentrated on a small enough portion of its surface. In both cases, the tendency to shatter is not the sole domain of the object, but rather the relation of the object’s structure and functioning to its environs. And this is the case for all such dispositions toward specific behavior. To attribute these tendencies solely to the object abstracts the object from the world and neglects to acknowledge the relation between the two.

The issue, however, is rendered all the more complex when we consider the common attribution of dispositions to people. In this case, our intuitive understanding of

the concept appears to extend beyond behavioral description to reference stable internal qualities of the individual (Facione, 2000). We claim, for example, that Jesse is friendly, that Adrian is generous, or that Alex is an angry person. While in each of these cases we assume some substantive link to behavior, such attribution directly references a characterological property, one that allows the occasional instance of contrary behavior to bear little effect on the presence of the attribute. This is very much true of the traditionally enumerated critical thinking dispositions, where terms such as open-minded, truth-seeking, and analytical describe not just behavioral tendencies but character virtues – stable, internal forces responsible for the expression of critical behavior. Such a conception, in fact, underlies a number of reputable assessments of critical disposition that utilize self-reports of attitudes toward these critical attributes (Giancarlo, Blohm, & Urdan, 2004; Facione & Facione, 1992). Here, disposition is conceived explicitly as a stable referent, as a “consistent internal motivation, to act toward, or to respond to, persons, events, or circumstances in habitual, and yet potentially malleable, ways” (Facione, 2000). Dispositions thus assume a causal relation to behavior instead of being defined by them. The result is a conceptualization of disposition that transcends descriptive abstraction. In divorcing dispositions from behavioral tendencies – that is, in conceiving of them as independent of, but causally related to, behavior - they become characterological constructs with explanatory power, allowing us to explain the tendency toward specific behavior in light of stable personal attributes.

And yet, shifting the referent of disposition from behavior to attitude presents its own problems. For unless we are willing to completely forgo the link between disposition

and behavioral tendency, we must assume that attitudes will sufficiently manifest in behavior. As Ennis notes, however, individuals can “feign the appearance of the disposition without really having it” (Ennis, 1996, p. 166), either through their actions in-the-moment (as when they are being assessed) or by their verbal responses. Facione offers a similar but broader claim, stating that “far too many [people] profess a disposition toward thinking, but, regrettably, are not capable of generating much mental horsepower” (Facione, 2000, p. 64). And several critical thinking theorists acknowledge that one could profess the disposition to “clarify and seek understanding...without being sensitive to situations calling for clarification” (Ennis, 1996, p. 166; also see Perkins, et al., 2000; Richhart, 2001). Such comments highlight the tension that exists between conceptualizing dispositions as personal attributes and satisfying their requirement to manifest as behavioral tendencies. For even if we grant that first-person reports of attitudes toward critical virtues can be reliable and relatively stable over time, there is little to *require* the corresponding behavior in light of one’s attitudes. Attitude toward behavior is not itself behavior, nor is it even a tendency to behave. And while it may seem intuitively alluring to tie the two together through causal relation, such a link itself neglects the variety of other factors, both personal and contextual, that can frustrate the realization of motivated intent. Stated in perhaps a more extreme way, an individual may have all the motivation in the world to behave in a particular manner and still fail to manifest the behavior. Indeed, that Facione comments on the number of people who fail to exhibit appropriate critical behavior despite an expressed affinity for it suggests that such a situation is more than a theoretical possibility when it comes to critical

disposition.²⁹ And if individuals can maintain a disposition toward a particular behavior without actually manifesting that behavior, we are left wondering what it means to have the disposition.

Let me propose, though, that the fact that we hold criticality as an educational aim forecloses any purely descriptive account of critical disposition. That is, to the degree that we believe that didactic interactions with students can foster the development of criticality in the direction of a held critical standard, we must conceptualize disposition as a causally explanatory construct. As merely descriptive abstraction, we might continue to hold that there is something about the object *as a whole*, and in relation to its environs, which is responsible for the manifestation of behavior - some causal sequence of events involving the structure and functioning of the object that explains why particular behavior manifests. Thus, we might point to the chemical structure of glass to explain why it breaks when it does, and why certain interactions between glass and the environment cause it to shatter. But to the degree that we cannot point to some potentially *malleable attribute of the object* – some causally efficacious attribute that we can modulate while maintaining the object’s integrity - we give up the ability to nurture behavioral change. Along these lines, we might note that adding Boron to glass makes it less apt to break in the presence of extreme temperatures, and that adding Calcium Oxide makes glass non-

²⁹ While we might possibly look to empirical studies to establish some correlation between attitude and behavior, it is strange that, at least in the domain of critical thinking disposition, there is little mention of such correlation. Rather, again, such a link is generally assumed to be the case, despite claims acknowledging the widespread existence of individuals who profess to value the critical virtues but fail exhibit them.

water-soluble. In each of these cases, we point to a potential target of interaction – here, the amount of Boron or Calcium Oxide contained in the glass - that we expect will causally modify the behavior of glass without compromising its integrity. Absent such targets, though, there is little reason to expect change, especially change of a desired type. “Pure” glass, conceived as a substance without manipulable attributes, has defined behavioral tendencies immune to change (Richhart, 2001). The same can be said with regard to criticality. Without conceptualizing it as something that extends beyond a description of behavioral manifestation, we lose the opportunity to effect change in critical behavior through our interactions with individuals. Thus, to the degree that we are committed to educating for criticality, the first condition on any conception of interrogative disposition is that it must explain critical behavior by reference to causally empowered constructs.

It is important to note, however, that such a condition does not mandate a reference to personal attributes. Indeed, there are numerous theories, many of them well-aligned with the central tenets of critical pedagogy, that postulate the primacy of social constructs in explaining behavioral tendencies. From Foucault’s articulation of power in *Discipline and Punish* (Foucault, 1977) to Marcuse’s interpretation of Heideggerean falling (Kellner & Pierce, 2011), these theories technically satisfy the first constraint on conceptions of critical disposition by articulating theoretical constructs external to the individual that are then taken to be the root determinants of behavior. That said, it is difficult to see how such constructs are themselves articulations of dispositions. Rather, they seem to be non-dispositional constructs that substitute for dispositions as the source

of behavioral tendencies. In some substantial sense, explanations of behavior that locate the cause of behavior external to individual obviate the need to invoke disposition to explain behavior. Or, perhaps more precisely, they reduce disposition to descriptive abstraction. For dispositions are always dispositions *of an object or individual*, and in cases of behavioral explanation that source the cause external to the object, there is once again no *thing* that belongs to the object – nothing *of* the object – that we can label as a cause of the behavioral tendency. The object assumes the character of a behavioral black box subject to the dictates of external forces, leaving us to view disposition as merely a description of how it has behaved in the past.³⁰

Thus, a second condition on a conception of criticality requires that the causally empowered construct be attributed to the individual. Such a condition, though, does not entail that we reject the influence of external factors upon disposition. Rather, it demands only that we acknowledge a measure of individual causal efficacy, the presence of an intermediate construct sourced in the individual capable of invoking some measure of behavioral modulation. Again, from the perspective of education for criticality, such a requirement seems fundamental. Without granting individuals at least a measure of

³⁰ Such a position evident in the writings of various critical theorists. For example, in “Education after Auschwitz,” Adorno questions his own call for education to take lead role in combatting social violence by stating that “If barbarism itself is inscribed within the principle of civilization, then there is something desperate in the attempt to rise up against it” (Adorno, 1998, p. 191). And Kellner, et al. express Marcuse’s more strident view of autonomy when summarizing his argument for revolution: “Since the individual is always a social individual and since one’s possibilities for thought and action are prescribed by the given social-historical situation, the individual project of liberation necessarily presupposes a project of social revolution” (Kellner & Pierce, 2011, p. 15). In both cases, the authors question the viability of fostering behavioral change through some direct alteration of the individual. Instead they view behavior solely as a consequence of environmental conditions.

autonomous decision making and belief adoption, the aim of nurturing criticality assumes the character of enculturation or perhaps even brainwashing. Stated in a slightly different manner, that education for criticality seeks to increase autonomy requires that we acknowledge the possibility of autonomy. And we foreclose on that possibility when we comprehensively reject the mediation of social forces by the individual.

From an educational perspective, we might look to two contrasting interpretations of Vygotsky's concept of internalization to further illustrate this point. Internalization, as articulated by Vygotsky, defines a learning process where individuals gain conceptual and procedural understanding by appropriating publicly constructed meaning. Metaphorically, the process lives up to its name, in the sense that the individual absorbs – or internalizes – the meaning that exists external to the subject. But, as Wertsch and Bivens (1992) explain, this metaphor can be cashed out in different ways. The apprenticeship interpretation defines a learning process based on imitation, one where a learner gains understanding by mimicking the behavior of a competent individual. To the degree that such learning is successful, learning is a matter of knowledge transmission, of replicating the understanding or know-how of a competent other without modification from the learner. In bypassing individual mediation of social forces, the apprenticeship model explains changes to thinking and behavior without the need to grant autonomy in the learning process.

The text mediational interpretation, however, articulates internalization in a manner that acknowledges the necessary contributions of the learner (Lotman, 1994). According to text mediation, internalization operates on a spectrum of univocal and

dialogic interactions that require varying degrees of modulation by an individual. While purely univocal interactions approximate a model of unadulterated transmission, learners in dialogic interactions partake in a process of meaning construction, one that “involves the reconstruction of psychological activity on the basis of sign operations” (Vygotsky, 1978, p. 57). Lotman (1994) elaborates this process from the perspective of semiotics, where such reconstruction results from the assimilation of public text into the existing “text” – that is, the conceptual understanding - of an individual.³¹ Such a process entails not the mere transmission of conceptual and procedural knowledge, but an inherently unpredictable and theoretically unique development of mental grammar dependent, in part, on the existing psychological constitution of an individual. Lotman further theorizes that two factors contribute to whether public text is perceived as univocal or dialogic – the semantic complexity of the text itself and the attitude of the individual toward its reception. So, while ostensibly simple statements such as “It is raining outside” may lend itself to univocal interpretation, a philosophical attitude toward such a statement would encourage a dialogic interaction resulting in a web of personal semantic reinterpretations.

These divergent elaborations of internalization illustrate both the need for, and the role of, internal constructs in the description of the autonomous individual. The apprenticeship model forgoes such constructs and results in what is tantamount to a banking model of learning (Freire, 1996), one where the individual plays little role in

³¹ While Lotman elaborates internalization in terms of the confrontation of texts, he makes it explicit that he is talking about the learning of a conscious entity: “When a text interacts with a heterogeneous consciousness, new meanings are generated, and as a result the text’s immanent structure is reorganized” (1994, p. 379).

determining her own conceptual development and belief structure. Text mediation, on the other hand, relies on individual constructs – both conceptual and attitudinal – to explain the possibility for unique understanding and divergent belief, two necessary characteristics of autonomous behavior. Here the influence of external factors is acknowledged but not determinative. That is, there exists something *of the individual* that contributes to conceptual understanding and belief adoption, something that enables the possibility of autonomous behavior. And to the degree that education for criticality seeks to engage that possibility, it must conceive of disposition in the same manner - as a causally empowered construct ascribed to the individual.

As such, it seems clear to me that we must elaborate everyday criticality as a mental construct, one that, while being subject to contextual influence, is understood to maintain some manner of autonomous character. The question, however, is how to further elaborate such a construct, especially given the relevance of longstanding debates over how to understand the mental. As I mentioned earlier, existing mental articulations of critical disposition acknowledge one or both of two possible components – motivation and sensitivity. In both cases, the particular elaboration belies fundamental assumptions regarding the nature of mind, particularly as it concerns its conscious functioning. As I analyze each conception in subsequent sections, I shall explore these assumptions, highlighting their implications for a critical ideal of appropriate questioning. For again, if we are committed to this ideal, our understanding of criticality must both render such an ideal viable and suggest a basis for it.

4.3. Critical disposition as mental motivation

There are numerous variants of the mental motivation conception of critical thinking disposition, and each articulates the multidimensional construct using diverse and sometimes conflicting terminology (Nieto & Valenzuela, 2012). We hear it described as mental habit (Costa, 2001; Siegel, 1988; Facione, 1990), as attitude (Tishman, 2001; Facione, 1990; Dewey, 2007; Siegel, 1988), as one's passions (Costa & Garmston, 2001; Perkins, Tishman, Richhart, Donis, & Andrade, 2000), or as a set of intellectual virtues (Richhart, 2001). A number of articulations employ seemingly incompatible terms, with Costa speaking of both of human passions (Costa & Garmston, 2001) and habits of mind (Costa, *Habits of mind*, 2001), and Siegel claiming that "the critical thinker... must have... certain attitudes, dispositions, habits of mind, and character traits, which together may be labelled the 'critical attitude' or 'critical spirit'" (Siegel, 1988, p. 39). Dewey, himself, notes the difficulty of employing available terminology to describe the concept, stating that

... we need a word to express that kind of human activity which is influenced by prior activity and in that sense acquired; which contains within itself a certain ordering or systematization of minor elements of action; which is projective, dynamic in quality, ready for overt manifestation; and which is operative in some subdued subordinate form even when not obviously dominating activity. Habit even in its ordinary usage comes nearer to denoting these facts than any other word. If the facts are recognized we may also use the words attitude and disposition. (Dewey, 2007, pp. 40-41)

Despite its complexity, Dewey's elaboration suggests how the ostensible conceptual conflict between habit and attitude might be resolved. Habit is not taken to mean an activity over which we have little or no control – as in a drug or alcohol habit – but rather

as an acquired default, but overridable behavior, as when we say that “Adrian has a habit of speeding.” And “attitude” is characterized by a consistency of position that suggests habitual motivation, a stable “projective” and “dynamic” influence on behavior.

This same alignment between habit’s connotations of repetition and stability and the more mindful and autonomous qualities of “attitude” find contemporary expression in Facione’s succinct elaboration of human disposition as “a person's consistent internal motivation to act toward, or to respond to, persons, events, or circumstances in habitual, and yet potentially malleable, ways” (Facione, 2000, p. 64). Here, the phrase “consistent motivation” conjoins the disparate notions of attitude and habit to express the conceptual nuance sought by Dewey. In framing dispositions in terms of motivation, Facione also expresses Dewey’s requirement of dynamism, of being able to autonomously override repetitive behavior. Yet the qualification of consistency serves to imbue motivation with the temporal stability more often associated with habit. As critical thinking disposition in particular, this mental motivation provides the specific impetus to engage critical thinking – that is, critical thinkers tend to engage in critical behavior because something about their own character propels them to act in this a manner. Such a description explicitly addresses the two constraints I have laid out – in this case, critical disposition is not identified with critical behavior per se, but with a causally empowered attribute of the individual that, in enabling “habitual, and yet potentially malleable” behavior, satisfies the requisite demand for autonomy. That said, Facione’s summary description addresses only the nature of disposition, not critical disposition, and thus requires further elaboration if the reference to consistent motivation is to offer value to an education for

criticality. For absent such detail, it becomes difficult to impart semantic substance to an ideal of critical disposition, leaving educators to guess what sort of pedagogical program might make individuals more “consistently motivated” to engage critical behavior.

Indeed, Facione offers seven components of critical disposition that, when viewed in the context of motivation, articulates a set of intellectual virtues capable of both causally explaining critical behavior and providing educators a workable model of the ideal critical disposition. These include the characteristics of being open-minded, judicious, inquisitive, confident in reasoning, analytical, and systematic. Such terms, of course, could by themselves be viewed as merely descriptive of an individual’s behavior, where a person’s open-mindedness, for example, is not a reference to a character trait – some enduring attribute the individual - but a general description of how he or she has behaved to date. However, given Facione’s umbrella conception of disposition, the seven components clearly define motivational forces independent of the behavior describable by that same name.

The same could be said for the nineteen personal traits that comprise the 1990 Delphi panel’s conception of critical disposition. In the case of the Delphi conception, though, the explicitly affective character of the dispositions presents additional understanding of disposition as a motivational, and hence causal, construct. Consider for example, the Delphi Report’s initial description of critical thinking disposition:

Although the language here is metaphorical, one would find the panelists to be in general accord with the view that there is a critical spirit, a probing inquisitiveness, a keenness of mind, a zealous dedication to reason, and a hunger or eagerness for reliable information which good critical thinkers possess but weak critical thinkers do not seem to have. (Facione, 1990, p. 11)

Here the use of “critical spirit” suggests an understanding of critical disposition as a construct independent of critical behavior, while the phrases “zealous dedication to reason” and “hunger or eagerness for reliable information” express the emotional basis for motivational force. Indeed, the fact that the report calls the 19 attributes the “Affective Dispositions of Critical Thinking” (Facione, 1990, p. 13) suggests that the Delphi panelists view dispositions as behaviorally motivational precisely because of their affective character. Such character provides the positively valenced force that propels critical thinkers to engage critically. In short, the Delphi panelists commit to the idea that affect or emotion *is* the motivation that underlies critical thinking behavior.

Beyer, too, calls attention to the centrality of affect when discussing the individual elaborations of critical disposition offered by Ennis and Paul, both of whom were Delphi panelists:

Notice the words used to describe these operations: drive, devoted, persistent, disposed, seek, and be willing. These attributes of dispositions, which reflect emotions and feelings, show that while critical thinking is objective, it is hardly value-free. Critical thinkers attach great value to seeking understanding, determining worth, and searching out the truth. The continuing persistent disposition to know what is true motivates critical thinking and guides it by basing its execution on a clear underlying value. (Beyer, 2001, p. 90)

Other proponents of critical thinking take a similar view. Scheffler (1991) speaks of the value of the cognitive emotions. Costa and Garmston (2001) list the five passions that belong to critical thinkers as a way to guide educators to nurture critical thinkers. And as Perkins and Ritchhart (2004) discuss, there are numerous psychological constructs akin to critical disposition that are similarly founded on motivation. Cacioppo and Petty, for

example, define the need for cognition as the “tendency to seek, engage in, and enjoy cognitively effortful activity” (Perkins & Ritchhart, 2004, p. 356). And Webster and Kruglanski articulate the need for closure as the “desire for predictability... [and a] discomfort with ambiguity, decisiveness, and closed-mindedness” (Perkins & Ritchhart, 2004, p. 356). In both cases, “need” is explicitly articulated as “a motivated tendency or proclivity” where motivation is cashed out in terms of affective experience (Webster & Kruglanski, 1994, p. 1049).

In some substantive sense, the motivational conception views critical disposition as a matter of desire – that is, critical thinkers are disposed toward critical engagement simply because they *want* to behave in that manner. Such desire, though, is a far cry from primal biological urge. Rather, it arises cognitively, from the perceived value of having the disposition, from believing it to be an intellectual virtue. As such, the motivational conception does not itself begin with motivation. It instead postulates a causal sequence from belief to affect to behavior, where affect provides the propulsive force to bridge the conceptual gap of purely cognitive beliefs and non-cognitive action. As a mediating construct, affective disposition enables us to explain critical behavior as a willed and rational endeavor, a product of the beliefs that we adopt for good reason. Such a model aligns particularly well with the metaphor of a “critical spirit,” which itself suggests a dualistic split between rational mind and physical behavior that requires a construct to link the two.

We might best see this rationalist-dualist model at work in two highly regarded and widely utilized assessments of the critical disposition, Facione’s (1992) California

Critical Thinking Disposition Inventory and Giancarlo et al.'s (2004) California Measure of Mental Motivation. Both assessments are based on responses to Likert statements that query individual beliefs about the use and value of critical thinking – statements such as "To get people to agree with me I would give any reason that worked," "Everyone always argues from their own self-interest, including me," and "if there are four reasons in favor and one against, I'll go with the four" (Facione, 2000, p. 72). In assuming that responses to these belief statements correlate with the tendency to engage critically, the assessments operationalize motivational disposition, assuming both that beliefs themselves lack the propulsive force to engage particular behavior, and that whatever does initiate behavior must have an affective character. Indeed, Paul acknowledges just such a position in claiming that "emotions, feelings, and passions of some kind or other underlie all of human behavior" (Paul, 1993, p. 348). And yet, for all the emphasis on personal feeling, passion, and emotional experience, the assessments articulate a model of cognitive behavior where affect serves only as a mediating construct, one subject to the dictates of belief. It is ultimately what one believes that determines value, and critical affect is only a byproduct of such value.

4.4. A critique of mental motivation

Before engaging a critique of the mental motivation conception, it is important to reiterate the difference between critical thinking disposition and criticality.

Notwithstanding Paul's more expansive articulation of strong sense critical thinking, critical thinking disposition has generally concerned the tendency to engage critical thinking, an activity devoted to rendering judgment with regard to problem solving,

decision making, and belief adoption. While I have argued that critical thinking is itself an inherently interrogative activity, I have also claimed that the disposition to engage critical thinking is distinct from the more narrowly-defined disposition to interrogate. Indeed, in articulating both assertive and interrogative components to critical thinking, I have attempted to clarify the distinction between the two. Where criticality concerns the tendency to question assertions, conceptualization of critical thinking disposition focuses on the tendency to formulate answers to already-defined questions by utilizing the cognitive skills that constitute critical thinking.

As such, it is possible to acknowledge the value of the motivational conception of critical thinking disposition while questioning its viability for criticality. The same can be said about the inverse – dismissing a conception of critical thinking disposition does not necessarily doom its prospects for criticality. Thus, in offering a critique of any conception of criticality, the issue is not so much whether a conception is viable as an understanding of critical thinking disposition, but whether it can serve to conceptualize criticality. That I have elaborated the motivational conception with regard to critical thinking disposition is a simply product of both similarity and necessity - since there is no literature devoted to interrogative disposition, the closest place to turn is the vast literature targeting its conceptual cousin. With this in mind, let us address the prospects for a motivational conception of criticality.

As I have emphasized repeatedly, a necessary condition on any viable conception of critical disposition is that it support an ideal of appropriate questioning. By support, I mean two things – on the most basic level, any such conception must be consistent with

the ideal. That is, nothing about an articulation of criticality should explicitly foreclose the possibility of substantively approximating the ideal.³² More importantly, though, to say that the conception supports the ideal requires that it provide reason for committing to the ideal, that it articulate something to which we can point as justification for adopting one ideal over others. And this is precisely the weakness of the motivational conception. While there is nothing explicit in affective motivation that forecloses the possibility of appropriate questioning, the conception offers little warrant for committing to it as an ideal. Indeed, I would suggest that the mental motivation conception is better, or perhaps only, suited for an ideal of *more* questioning. Appropriate questioning requires not just a stable affective state that drives critical engagement. It demands a brake on motivation as well, one that signals when we ought to refrain from interrogating. The mental motivation conception makes no accommodation for such restraint. It characterizes critical disposition solely as a propulsive force, one that drives the ideal critical thinker to engage critically. As such, it fails to acknowledge a core claim of the appropriate questioning ideal - that we should not question everything. While the motivation conception does not offer outright claims to the contrary, its silence on the need for an interrogative upper bound opens the door for the more extreme attitudes toward questioning that I discussed in Chapter 2.

³² Of course, one might point to the vagary of the phrase “substantively approximate.” While I agree that further elaboration is ultimately necessary, I am not sure that leaving the phrase as is should warrant any serious reservations at this point.

It is interesting, and perhaps telling, then, that proponents of the mental motivation conception also speak of the appropriate use of critical thinking. Consider Facione, who, despite defining disposition without any requirement of appropriateness, later offers a single passing reference to the condition:

We worry that our educational programs at all levels, from K-12 through college and into adult and professional development, will fail if they focus only on skills to the neglect of the consistent internal motivation to use those skills in the appropriate circumstances. (Facione, 2000, p. 80)

Note here how the addition of the phrase “in the appropriate circumstances” substantially changes Facione’s conception of critical disposition. Rather than being characterized solely as a motivating force for behavior founded on affect, critical disposition now expresses a cognitive element, one that requires individuals to evaluate circumstances before initiating critical engagement. Such a conception is at odds with the purely affective conception, which allows that critical behavior is appropriate in all circumstances. It also leaves us asking how motivation alone can account for the necessary critical judgment.

In terms of understanding Facione’s position, we thus have two choices. We might view this statement as a mistake, chalking it up to a lazy use of words at the end of a long article.³³ Or we might treat it as an explicit and intentional aspect of his elaboration, in which case the logical gap between affective motivation and the judgment

³³ Indeed, Facione offers this first reference to “appropriate circumstances” shortly before the concluding paragraph, in a section on pedagogical recommendations. By this point, Facione has long finished any explication of his theoretical position.

required by appropriateness becomes particularly problematic. While it is difficult to come to any reasonably definitive answer from reading the text, I suspect that that Facione has not fully considered the difficulty of reconciling affective motivation with the cognitive implications of appropriateness, as other references to the latter are similarly left unexplained. Regardless, his reference to appropriateness should make clear the substantive effect it bears on the motivational conception.

This same tension between motivation and appropriateness is more explicitly apparent in the Delphi conception of critical disposition. Unlike Facione's elaboration, the Delphi Report (Facione, 1990) exhibits no shortage of references to the "appropriate use" of critical thinking skills. We are told that critical thinkers "appropriately formulate categories" (p. 6), "apply appropriate modes of inference" (p. 9), and "meet objections to the... contextual appropriateness of inferential, analytical or evaluative judgments" (p. 10). More generally, the panelists state that "...being adept at CT skills but habitually not using them appropriately disqualifies one from being called a critical thinker at all" (p. 12). Such conditions ostensibly suggest commitment to an ideal of appropriateness over "more is better." However, the panelists follow up these claims by stating that "if [individuals] are good critical thinkers, then they use their CT skills appropriately *because* good critical thinkers also have some or all of the affective dispositions listed in Table 5" (p. 12, emphasis is mine). Thus, we are led to believe that appropriate use of critical thinking skills is a result of having the appropriate affective dispositions. And yet, how is it possible that a construct framed in terms of motivation and willingness to engage critically can have anything but the most indirect link to the skill required to

determine appropriateness? Again, we are left to speculate that proponents of the motivation conception fail to fully recognize the work required to bridge the gap between motivation to engage and the appropriateness of engagement.³⁴

Finally, we might explore Siegel's use of the term "appropriate" in his "reasons conception" of critical thinking. Siegel's reliance on appropriateness is perhaps more explicit than either Facione or the Delphi panel, as he succinctly defines the ideal critical thinker as one who is "appropriately moved by reasons." He elaborates upon this conception by offering that

A critical thinker must not only be *able* to assess reasons properly... she must be *disposed* to do so as well; that is, a critical thinker must have a well-developed disposition to engage in reason assessment. A critical thinker must have a *willingness* to conform judgment and action to principle, not simply an ability to conform... She applies the skills and abilities of reason assessment in all appropriate contexts, including those contexts in which her own beliefs and actions are challenged. (Siegel, 1988, p. 39, emphasis is in the text)

Stated in this manner, the use of "appropriately" again ostensibly suggests a critical ideal that extends beyond the call for more critical thinking, for the critical thinker assesses reasons "in all appropriate contexts." While we may naturally focus here on the phrase "in all appropriate contexts," it is important to emphasize that the phrase applies to reason assessment. Siegel's intent, as I interpret it, is to emphasize Paul's (1984) strong sense

³⁴ Such speculation is further justified by comments like "being skilled also involves having some degree of proficiency in executing those procedures and being willing to do so when appropriate" (p. 14). Given the Delphi panelist's commitment to the skills/disposition dichotomy, the fact that they append a condition of appropriateness to the willingness of the critical thinker without further discussion about what is involved in determining appropriateness, suggests a disregard for, or a lack of recognition of, the cognition involved in determining the "when" of critical engagement.

critical thinking – that good critical thinkers assess reasons not only when it serves their self-interest, but even in situations where one’s own beliefs are challenged.

Unfortunately, the statement explicitly applies the condition of appropriateness only to reason assessment, to the assertive component of critical thinking. It says nothing about appropriate contexts of interrogation, leaving us to look elsewhere for his position on that matter.

Perhaps it is no surprise, then, that Siegel does not extend the condition of appropriateness to the interrogative side of critical disposition. Like both Facione and the Delphi panelists, the text of *Educating Reason* (Siegel, 1988) clearly expresses Siegel’s commitment to the “more is better” conception. To see this, consider how Siegel continues the passage above. He states: “for the possessor of the critical attitude, nothing is immune from criticism, not even one’s most deeply-held convictions” (Siegel, 1988, p. 39). While this statement is intended to reinforce the need for strong sense critical thinking, it suggests that anything can and should be questioned, a point that I have repeatedly rejected as antithetical to the ideal of appropriate interrogation. Indeed, I have presented the ideal of criticality as a paradox precisely because it demands that we interrogate our “most deeply-held convictions” in the face of not being able to question everything. Siegel’s view, on the other hand, accepts the viability of unbounded questioning and commits to a critical ideal that encourages it.

We might also look to Siegel’s argument against the “slavish devotion to reason,” which we examined in Chapter 2, as further evidence of his commitment to the “more” ideal. This might sound surprising, as the argument itself seems like another instance of

justification for appropriate interrogation. Here Siegel claims that there are times when it is “rational to be irrational,” that context and goal dictate when we are justified in forgoing critical engagement:

If my mental health requires me to take a break from paying attention to reasons, or if my piano-playing will benefit from ignoring reasons for striking a certain key at a certain time and rather playing ‘by feel’ or automatically, or if my love-making will benefit in quality and intensity by “shutting my mind off” ...these may all be good (meta-) reasons for ignoring reasons which are otherwise relevant to my beliefs and actions. In such cases reasons are ignored or set aside, but for good reason. (Siegel, 1988, p. 133)

This certainly sounds like a position in support of appropriate interrogation – indeed, that we refrain from critical engagement (“reason assessment,” in Siegel’s parlance) for good reason would seem to be a telltale characteristic of appropriate critical disposition. And yet, it is not difficult to see how such claims actually support the “more is better” conception.³⁵ For in concluding that “the critical thinker should... be critical about being critical” (Siegel, 1988, p. 133), Siegel seems to require that in order to refrain from critical thinking, the critical thinker must first engage critical interrogation. That is, he or she must critically judge whether a situation warrants critical engagement before deciding to forgo a critical response. Such a process is tantamount to committing to the “more” conception, as the only way to critically forgo first-order reason assessment is to engage critical evaluation of second-order reasons. In other words, Siegel demands that we

³⁵ That Siegel’s view justifies the “more” conception has important ramifications for how we should ultimately conceive of criticality. We shall return to this point in Chapter 4.

critically engage in order to forgo critical engagement. As such, we approximate the standard of critical disposition only to the degree that we approach decisions about belief and action critically. That, almost by definition, constitutes the “more is better” ideal.

I would propose that the unaddressed (and perhaps unrecognized) gap between motivation and appropriateness is inherently tied to the confusion I articulated in Chapter 2 whereby the contingent goal of increasing critical engagement is mistaken for a critical ideal. Consider recommendation 5 of the Delphi Report:

Just as with the cognitive dimension of CT, when conceiving of the education or assessment of critical thinkers, it is important to consider ways of developing materials, pedagogies, and assessment tools that are effective and equitable in their focus on these affective dispositions. The cultivation of these dispositions is particularly important to insure the use of CT skills outside the narrow instructional setting. Persons who have developed these affective dispositions are much more likely to apply their CT skills appropriately in both their personal life and their civic life than are those who have mastered the skills but are not disposed to use them. (Facione, 1990, p. 13)

As a goal of critical thinking in the here and now, recommendation five sounds perfectly reasonable. I would think that the vast majority of educators, myself included, would agree that both children and adults, as well as society as a whole, could stand to benefit from an increase in critical engagement.³⁶ And it further seems right to claim that “persons who have developed these affective dispositions are much more likely to apply their CT skills appropriately...”. However, neither of these claims implies that

³⁶ This I would think is true both when we think of critical engagement from the assertive aspect of critical thinking or the interrogative aspect of criticality.

development of affective disposition should be held as a critical ideal. Rather, such development should be viewed instrumentally, as the current means to a universal end of appropriate engagement.³⁷ Indeed, recommendation five sounds reasonable only because we also believe that most individuals do not *currently* manifest sufficient critical engagement. Given that more mental motivation is likely to increase the sheer quantity of such behavior, the relation between motivation and appropriateness holds – more motivation is likely to yield more appropriate critical behavior. But for those individuals who are already overly motivated toward critical engagement, more motivation means only a movement away from the ideal. Thus, the legitimacy of any claim that ties more motivation to more appropriate critical behavior is contingent on current conditions. And such contingency necessarily forecloses a claim of universal applicability. This, I propose, is ultimately the mistake made by proponents of mental motivation. Given the perceived urgency of increasing critical engagement among a population broadly taken to be critically deficient, the Delphi panelists and others fail to recognize the impact of the counterfactual on the ideal. Of course, more critical engagement should be a ramification of the ideal in the here and now. But such a claim is a far cry from saying that the contingent goal of more motivation should itself constitute the ideal.

Having analyzed how Facione, Siegel, and the Delphi panelists utilize the notion of appropriateness, we can now articulate an important distinction between critical

³⁷ Indeed, I would argue that in stating that “persons who have developed these affective dispositions are much more likely to apply their CT skills appropriately...,” recommendation five tacitly acknowledges the instrumental role of the affective dispositions.

thinking disposition and everyday criticality. Indeed, critical thinking disposition requires the concept of motivation in a way that everyday criticality does not. In prioritizing an end goal of judgment and evaluation, critical thinking requires that individuals critically follow-through on already-posed questions and already-identified problems. Such follow-through does require motivation, as critical judgment demands a level of cognitive effort not required by its non-critical counterpart. But to what degree is motivation required to ask questions or pose problems?³⁸ Clearly, the act of publicly posing questions demands motivation, as one must care enough to exert the requisite effort to bring such questions to the attention of others. In this case, again, motivation is needed specifically for follow-through. But is follow-through required to ask questions and pose problems *to oneself*, to merely recognize that a particular question or problem exists? Is there not a sense in which questions and problems simply “present” themselves? And if that is the case, to what degree, and in what sense, is motivation required?

Here, I think, the concept of demand plays a role. In demanding situations – those that might exist in the classroom, workplace, or the therapist’s office - we are asked to search for questions and problems. If we assume that such a search requires effort that would otherwise not be exerted, following through with the request would seem to demand motivation. But by definition, no such request is made in non-demanding

³⁸ I might note here that this question applies to both questions and problems that initiate critical engagement and those that form in the course of ongoing interrogation.

situations. We are left to our own critical devices, often in the context of being focused on something other than critical interrogation. Unless we, for some reason, consciously seek out questions and problems on our own, motivation does not seem to be much of a necessity in getting us to “self-ask” a question or “self-articulate” a problem. Questions and problems just appear, even without the motivation to find them.³⁹

As such, we might acknowledge motivation as a requirement for critical thinking disposition while circumscribing its utility for criticality. Motivation is required for the assertive aspect of critical engagement, for following through with the critical evaluation of already-posed questions and acknowledged problems. This is the motivation about which critical thinking theorists speak – the motivation to engage critically when one is confronted with a question or, as Dewey noted, when an individual senses the personal “disequilibrium” that accompanies problem recognition (Dewey, 1910). And motivation is further necessary for critical interrogation in demanding situations, for seeking out questions and problems when asked or expected to do so. But when it comes to non-demanded - i.e. everyday - interrogation, no such requirement exists. Indeed, actively

³⁹ Indeed, there is something odd about the idea of asking a question to oneself that suggests we might conceive of the act differently. When we ask someone *else* a question, we have already acknowledged the question as a question – we understand the semantics of the speech act *before* we execute it. However, in asking a question to ourselves, we do not know the question before it is asked – what it is that “we” are asking is understood, at best, during the asking. Rather than asking ourselves questions, then, I would suggest that, even in our own head, we are *asked* questions, that the “self-asking” of a question is better conceived as not an act of the self, but of something pre-personal. A similar idea is expressed by Hannah Arendt’s metaphor of “the wind of thinking” (Arendt, 1978) which, as Vansieleghem explains “refers to something that happens *to us*, something that we could not expect and that puts us into doubt” (Vansieleghem, 2005, p. 27). Such a reconceptualization of questioning as something that happens to us is a central part of this work, and I will spend all of Chapters 4 and 5 developing this idea, both from the phenomenological and the neuroscientific perspectives.

seeking questions and problems in non-demanded situations may work at cross-purposes to our goals, marshalling cognitive resources to secondary or tertiary aims at the expense of the primary one. While we may be motivated to search for questions and problems when left to ourselves, nothing precludes them from appearing in the most unexpected of moments, when we are far from manifesting in-the-moment an affective internal motivation to question, inquire, or be curious. Such is the criticality that transcends the tendency to engage the assertive component of critical thinking. Thus, rather than speak only of the need to nurture the critical (thinking) spirit of students, educators might also address the need for an interrogative spirit, one that shines not only when individuals are willfully motivated, but when motivation is directed elsewhere.

4.5. Critical disposition and sensitivity

While the need for critical follow-through on already-posed questions and problems justifies motivation as a necessary condition of critical thinking disposition, I have argued that a critical ideal of appropriate questioning exposes the insufficiency of viewing criticality solely as a matter of motivation. A number of critical thinking theorists and researchers have suggested that the same holds true with regard to critical thinking as well - that motivation is not itself a sufficient condition for critical thinking disposition. Perkins et al. (1993; 2000; Perkins & Ritchhart, 2004; Tishman, 2001) have proposed a dispositional theory of thinking consisting of three components – skill, inclination, and sensitivity – that they argue satisfy the requirements for “good” thinking. Rather than speak of mutually necessary skill and disposition, the several Perkins groups conceptualize thinking as a fundamentally dispositional activity outside the classroom -

or, as they state, “in the wild.” In critiquing attempts to elaborate good thinking as something that happens upon demand, Perkins et al. highlight the problems associated with the traditional split between thinking skills and dispositions. To the degree that education seeks to develop the thinking of individuals as they engage the world, the dispositional theory suggests that it makes little sense to speak of good (or skilled, or critical) thinking independent of the actual tendency to employ such thinking at the right, or appropriate, moments. Good thinking, put simply, entails the “when of thinking” (Perkins & Ritchhart, 2004). That is, without employing thinking skills *when* appropriate, without “knowing” *when* to engage in evaluation or analysis, or *when* to make logical inference, engagement in skilled critical interpretation, analysis, evaluation, etc., fails to constitute an expression of good (or critical) thinking.

The when of good thinking, according to Perkins et al., is not simply a matter of motivation. “When” certainly requires follow-through, and hence motivation, in order to *express* appropriate thinking. But it first requires that we recognize, or become aware of, opportunities to utilize the skills of good thinking. The Perkins groups term the tendency toward such awareness “sensitivity,” and view its development as central to the development of the critical spirit. As Richhart states,

perhaps the most difficult aspect of developing intellectual character centers around the cultivation of students' sensitivity to or awareness of occasions for employing their thinking skills. Research indicates that it is precisely in this area where people's performance breaks down. (Richhart, 2001, p. 12)

Indeed, the emphasis on the need for both recognition and follow through is directly linked to the goal of educating for good thinking outside of the classroom, where the

individual is often not primed to pick up on the situational need to employ critical thinking skills. Perkins et al. elaborate:

... the challenges of exercising one's intelligence "in the wild" are strikingly different from those in such tame laboratory and testing situations. (cf. Hutchins, 1996). Everyday contexts present a wilderness of vaguely marked and ill-defined occasions for thoughtful engagement. *Opportunities for investing one's intelligence must be detected.* When they are, whether to bother is often more a personal decision than a compelling need. In everyday life, people's sensitivity to subtle occasions for thinking and their inclination to follow through would appear to be substantial influences on intellectual performance alongside their capabilities. (Perkins, Tishman, Richhart, Donis, & Andrade, 2000, p. 270 - emphasis is mine)

This passage emphasizes again the centrality of the "when" of good thinking in everyday life and the core role served by sensitivity. Good thinking is not a product solely of the ability and desire to employ thinking skills. Rather, it entails the recognition of opportunities that are ripe for cognitive – and specifically, critical – engagement.⁴⁰

Seen from a slightly different perspective, the introduction of sensitivity as a critical construct influences a long-standing debate over the nature of critical thinking, one that further highlights the interrogative nature of criticality. As detailed in the Delphi Report, panelists could not reach consensus whether the use of critical thinking skills was

⁴⁰ It is important to note that in this passage, Perkins speaks of the sensitivity to critical opportunities as a matter of detection. Such phrasing, I believe, does not capture the core intent of the sensitivity construct, which is better described by Richhart's phrase "awareness of". Detection leaves open the possibility that awareness is a result of some potentially cognitive act, some "figuring out by the subject" that a situation presents a critical opportunity. Sensitivity, on the other hand, is introduced specifically as a non-cognitive construct, one that connotes mere reaction to a situation. At its core, sensitivity entails the tendency to become aware of critical opportunities, particularly through sensing or experiencing particular situations as critical opportunities. Perhaps the term that best captures this "awareness of" is "recognition," where recognition of a critical opportunity is the awareness of a situation as a critical opportunity.

itself an expression of critical thinking. While roughly one-third of the panelists accepted this position, the remaining participants required that the dispositional characteristics of the critical thinker – the attributes of open-mindedness, love of truth, and fairmindedness, etc. - be present as well (Facione, 1990). This majority viewed the self-interested, manipulative use of critical thinking skills in much the same light as Paul's weak-sense critical thinking - as a form of sophistry rather than an expression of desired cognitive behavior. Mulnix (2012), on the other hand, has recently advocated for the legitimacy of weak-sense critical thinking, arguing that the dispositional characteristics concern ethical considerations that bear little relevance to the expression of critical thinking. On Mulnix's account, whether critical thinking skills are employed in a context of fairmindedness and without consideration of self-interest is irrelevant to critical thinking itself. Thinking that employs the critical thinking skills is, by definition, an expression of critical thinking, ethical considerations notwithstanding. In summarizing her position, she notes that critical thinking "is a theory about how to think, not about how to live" (Mulnix, 2012, p. 467).

While the "when" of thinking would seem tangential to the relevance of these ethical considerations, it seems clear to me that it does settle the issue whether the use of critical thinking skills on their own are sufficient to constitute an expression of critical thinking. For critical thinking demands not only we utilize such skills, but that we use them in appropriate circumstances, in situations that warrant critical engagement. In other words, an essential characteristic of critical thinking behavior is that the skills be utilized at the right time, in the right circumstances. As such, the demanded or mere use

of such skills - which is often the case in the classroom or during assessment - fails on its own to constitute an instance of critical thinking. Of course, this leaves open whether ethically-relevant dispositional components factor into a conception of critical thinking. But to the degree that the when of thinking is construed as a dispositional component – that is, as one that concerns the tendency to engage in critical behavior - it would seem that critical thinking itself requires some aspect of disposition.

It is important to note that this conclusion is meaningful only in the context of a theory of critical thinking founded on the dichotomy between skills and disposition. Absent such a dichotomy, it becomes moot to question whether dispositional attributes must accompany the use of skill for the expression of critical behavior. That the dispositional theory lacks such a dichotomy is one of its most salient features, perhaps more so than the introduction of sensitivity. Indeed, each of the trio of components is articulated by Perkins et al. (1993) as a dispositional element, as a necessary contributor to the tendency toward critical engagement. This is especially important with regard to the skill component, which in the context of a skills/disposition dichotomy, is defined in opposition to disposition.

That recognition of critical opportunities should be included as part of the conceptualization critical thinking and not just considered an attribute of the critical thinker would seem to align well with my earlier articulation of “critical” as being fundamentally interrogative. When we use critical skills inappropriately – either by forgoing them when warranted or employing them when unwarranted – it becomes difficult to say that we are expressing critical behavior, regardless of the competent

execution of inference, analysis, or evaluation. Indeed, we may (or may not) be utilizing critical thinking skills, but in cases of inappropriate application, we have failed to determine that critical engagement is itself warranted. And as I argued at the start of Chapter 1, any determination to utilize critical skills is the expression of the implicitly or explicitly asked question “Should I engage critically?” As such, the failure to engage critically, even when competently employing critical thinking skills, can be seen as a failure with regard to the interrogative aspect of critical thinking. Here again, we are reminded that the criticality of critical thinking emanates from its interrogative character. And if we are to label instances of thinking as critical thinking, the decision to engage or refrain from using critical skills, and the question that underlies any such decision, must itself be considered part of the act of critical thinking. The utilization of critical thinking skills – the assertive aspect of critical thinking - might be viewed as the expression of competent thinking when abstracted from the general context in which it is employed. However, if we are to consider such thinking as *critical* thinking, the interrogative, and hence, the dispositional, components must be considered as well. Put simply, the interrogative response to context is central to the critical character of critical thinking.

While the dispositional theory initially offered a reasonable but speculative case for introducing the sensitivity construct, one of the Perkins groups sought empirical warrant for its inclusion alongside skill and disposition. In a set of four studies with primary and secondary students, the group sought to justify the conceptual integrity and “psychological separability” of each of the three components, explore a correlation between ability and sensitivity, and test the extent to which sensitivity could be conceived

solely as a matter of recognition (Perkins, Tishman, Richhart, Donis, & Andrade, 2000). In the first study, researchers presented 64 eighth grade students with three tasks related to a number of fictional passages. Each passage related a story where a character exhibited two critical thinking shortfalls in the process of rendering judgment or making a decision – the failure to seek alternative options, and the failure to seek reasons for the various sides of a case. In a test of in-the-wild sensitivity, students were asked to read some of these passages, point out those parts where a character failed to demonstrate appropriate thinking, and elaborate the reasons for their choices. Researchers subsequently assessed inclination (or follow-through) by presenting students additional passages with highlighted and explained shortfalls, a setup intended to remove any need for recognition. In this study, students were asked if they viewed the presented shortfalls as problematic and were instructed to explain what they would do in such a situation. Finally, in a test of ability independent of both sensitivity and inclination, students were simply asked to propose possible remediation of labelled shortfalls.

The Perkins researchers found that both recognition and inclination presented significant impediments to critical behavior. Whereas students on the inclination assessment demonstrated an average of 45% of the ability exhibited on the ability-only assessment, they showed only 13.5% of their ability when asked to detect shortfalls. The researchers expressed surprise at the extremely poor results, prompting them to note that

typically, shortcomings in intellectual performances are attributed to either a failure of ability or a failure of motivation (an aspect of inclination). These results are surprising because they suggest that low sensitivity, rather than low inclination, may be the larger obstacle to good thinking (Perkins, Tishman, Richhart, Donis, & Andrade, 2000, p. 275).

The group achieved a similar result in a second study with 94 sixth graders, where in removing the inclination component of the assessment, the researchers found a statistically significant difference between average detection performance and ability performance. Perhaps more dramatic was the finding that while over 91% of the sensitivity scores were deemed “low,” only 49% of ability scores were given such a designation. The third study of 105 eighth graders offered findings well-aligned with the previous two, as researchers found that asking students to find shortfalls described on a crib sheet provided to them did not improve the detection rate. Indeed, students who received no such “knowledge priming” generally performed better at detection assessment than those receiving the prompts. In this case, the authors viewed the results as evidence that sensitivity to shortfalls exists as a dispositional factor over and above the mere knowledge of such shortfalls.

While these results should be viewed for what they are - an initial exploration warranting further empirical confirmation – they suggest the viability of sensitivity as a legitimate component of critical disposition. This is especially reasonable in light of the theoretical deficiencies of the motivational theory, particularly its inability to account for the critical ideal of appropriate interrogation. As I have claimed, it is all too common for theorists to confuse the legitimate contemporary demand for more critical engagement with the universality of a critical ideal. Such confusion legitimates the “more is better” ideal despite its lack of a mechanism to justifiably avoid critical interrogation. The introduction of a dispositional construct that acts as a potential gatekeeper of critical behavior at least offers the possibility of articulating such a mechanism. The

dispositional theory suggests that it is not enough to value, and hence desire, critical thinking engagement. Other factors determine whether such behavior is manifested, including not only recognition, but the ability to utilize critical thinking skills. Perkins and Ritchhart (2004) aptly summarize this view:

[Our views] challenge a presupposition of most dispositional accounts: being disposed to engage situations thoughtfully is essentially a motivational matter of attitudes, commitments, incentives, and so on. We argue that thinking often falters through missing the moment altogether rather than declining to seize it. Obliviousness contributes at least as much as reluctance. (p. 353)

While Perkins and Ritchhart apply this position to critical thinking, it relates perhaps more directly to the issue of criticality. For criticality pertains only to the interrogative aspect of thoughtful engagement, to the moment of questioning that we confront in experience. This is the moment this is often missed without realizing it, and it is a moment that is not necessarily subject to the dictates of motivation. The recognition of an opportunity to critically engage *is* the recognition of a question, the feeling that there is something “not right” with merely accepting what is put before you. And unless we are actively searching for questions, such recognition, like the recognition of a friend who we perchance meet on the street, happens whether or not we are motivated to see it.

4.6. Recognition and the critique of sensitivity

While the acknowledgement of recognition as a factor in critical disposition is a welcome advance in the conceptualization of critical thinking and especially criticality, the introduction of sensitivity as a construct is not without shortcomings. For there is little in the Perkins elaboration that enables sensitivity to substantiate its gatekeeper role

in a manner that satisfies the requirement for appropriate questioning. Understood in a general way, to say that an individual is appropriately sensitive to critical opportunities seems reasonably benign. Such an individual recognizes the possibility of reacting critically to situations that a critical standard deems as justifying such a response. This, I believe, summarizes the conceptual elaboration offered by Perkins. And yet if this is the extent of the conceptual elaboration, we are left asking further questions, particularly if we approach the construct from the perspective of education, where the goal concerns the approximation of a critical ideal. For one, how is it that individuals are critically sensitive to some situations and not others? Such a question would seem to suggest that sensitivity, too, better aligns with a “more is better” critical ideal. In its everyday usage, sensitivity suggests a threshold quantity for response, as when we claim that an individual is sensitive to cat dander. In this case, once a person is exposed to a particular quantity or concentration of the substance, we expect a to see a reaction. And we assume that increased levels of the substance will continue to yield a reaction.

Such an understanding, however, aligns poorly with the notion of appropriateness. Unlike sensitivity, appropriateness does not pertain to quantity, nor does it specify an analog threshold for reaction. Indeed, one’s recognition of a critical opportunity is likely dependent on a plethora of variables that makes it possible to recognize subtle instances of one type of thinking shortfall while remaining oblivious to more egregious instances. Put simply, increasing one’s sensitivity to critical opportunities on its own is not sufficient to account for the “targeted” sensitivity demanded by an ideal of appropriateness.

The difficulty with Perkins' elaboration of sensitivity is that while it acknowledges the need to recognize opportunities for critical engagement, it fails to adequately articulate the concept of an opportunity. Clearly, the Perkins assessments view the absence of "seeking both sides of a case" as a critical opportunity. But is it a critical opportunity to be confronted with the assertion that the Earth is 93 million miles from the sun? For even in this situation, there *is* another "side of the case" - it is possible that the statement might be false.⁴¹ Indeed, by this reasoning, almost any situation or assertion could be viewed as an opportunity for critical engagement, even famously simple assertions such as "I have two hands" (Moore, 1939). Such "opportunities" are endless – they confront us continually in our everyday existence. And if we seek to exclude such situations from the domain of "truly" (or legitimately, or reasonably) critical opportunities, it is insufficient to invoke the concept of critical sensitivity. Rather, to the degree that sensitivity supports the critical ideal of appropriate questioning, it is necessary to tie sensitivity to judgment. Without such a relation, there is little in the concept of sensitivity that enables individuals to recognize appropriate critical opportunities. Indeed, as I have argued repeatedly, we are appropriately critical only to

⁴¹ Here, I wish to again acknowledge the Wittgensteinian position that not all statements can be questioned. However, if one argues that a particular statement is not truly questionable, that it forms part of the axiomatic "riverbed" (Wittgenstein, *On certainty*, 1969) underlying knowledge claims, there are a host of others that certainly could be referenced. For while each particular claim (according to Wittgenstein's position) either is or is not logically questionable, the domain of propositions rests on a spectrum of questionability where some questions that we should not question are indeed logically questionable. The question I have offered seems to fall into such a category, but there are innumerable others that could be proffered should this particular one seem contestable.

the degree that we are *not* sensitive to all critical opportunities – that we are “critically encapsulated”.⁴² Such a requirement derives from the fact that critical engagement ultimately serves belief, action and decision-making. And without the judgment to filter out reasonable opportunities from unreasonable ones, the introduction of sensitivity does not get us much closer to articulating an understanding of criticality that supports an ideal founded on appropriateness.

4.7. Criticality as a form of judgment

But what does it mean to *tie* sensitivity to judgment? In what way is judgment related to critical behavior? Here, I offer two specific claims that will be unpacked and defended in the following two chapters. First, I propose that everyday critical disposition is a product of our conscious critical meta-judgments - that our prior assessments of instances of critical and uncritical response bear causal effect on our tendency to critically engage. Such effect, I will argue, exhibits a distinct characteristic – it tends to align future critical tendency with past assessment, so that critical recognition is not simply the habitual reenactment of previous decisions, but their justified modulation. We might thus describe criticality as the embodiment of previous judgment. Second, I offer the stronger and perhaps more contentious claim, that the recognition underlying Perkins’ concept of sensitivity is itself an act of judgment. Together these claims present a

⁴² This phrase is a variant of what Fodor (Modules, frames, fridgeons, sleeping dogs, and the music of the spheres., 1987) calls an “informationally unencapsulated” situation, one that offers no criteria for determining which information is relevant to a situation.

complex view of criticality where critical recognition (and, indeed, non-recognition as well) involves an act of judgment that is itself the embodiment of previous judgment.⁴³

Conceived in this manner, the concept of critical recognition provides a basis for validating the ideal of appropriate everyday criticality - and the core of my argument requires a conceptualization that accounts for this ideal. Where sensitivity, on its own, simply accounts for the need to become aware of critical opportunities in order to enable the possibility of a critical response, recognition as judgment explains how we might be able to respond to appropriately critical opportunities while ignoring those that a standard of criticality says ought to be ignored. In providing the evaluation of a situation or assertion with regard to the need for critical response, such a conception offers a straightforward way to explain criticality without the need to invoke the concept of “more criticality.” To state my proposal in an overly simplistic manner – one that clearly requires further conceptual unpacking - we respond critically to some assertions but not others because we recognize that a critical response is warranted, and such recognition itself entails judgment. Whether we follow through on that recognition is, as Perkins et al. explains, a further matter, but judging critical warrant is that first step toward a critical response. In this way, I suggest that judgment is at the root of critical disposition.

That we should entertain a conceptualization of critical recognition as judgment follows, in part, from a commitment to the ideal of appropriate questioning. Appropriate

⁴³ At times, I will employ phrases like “recognition as judgment” and “recognition as a form of judgment.” In all such case, the phrase should be taken as shorthand for the clumsier phrase “recognition as a form of judgment that embodies previous judgment.” That is, in speaking of recognition as judgment, I intend the specific conception that I have elaborated above.

questioning, as I claimed in Chapter 2, is reasonable questioning, and reasonable questioning requires that we assess the warrant for engaging critically. Such assessment simply *is* an act of judgment – judgment whose quality can be assessed by approximation to the ideal. One may claim that this approaches the issue backwards, that rather than conceptualize criticality to align with the ideal of appropriate questioning, we ought to underwrite it with an accepted conception of criticality. However, given both the questionable consensus around the motivational conception and its attendant conceptual problems, starting with the ideal offers a fresh look at an issue on which we have made little recent progress. Indeed, as I will argue later, the ideal enables an elaboration of criticality that both aligns well with current neuro-cognitive theory and empirical consciousness research, and at least theoretically, can be subject to future empirical study. In taking this approach, it is my suspicion that the confused and semi-acknowledged commitment to appropriate questioning expressed in the critical thinking literature offers a window onto criticality, suggesting an implicit acknowledgement of the centrality of judgment in interrogative disposition. If I am right about this, we have had all along some obfuscated insight into the nature of critical engagement that future empirical exploration might validate.⁴⁴

⁴⁴ Indeed, I would argue that this obfuscated insight is expressed in the careless use of “appropriateness” exhibited by proponents of the motivational conception. As I discussed earlier, Facione, Siegel and the Delphi panelists all speak of appropriate use of critical thinking skills without recognizing the gap that such talk presents in the context of mental motivation. It is the unanalyzed commitment to “appropriateness” in the face of this conflict that expresses this inkling of insight.

That said, my proposal clearly requires further explanation, for it presents at least two substantial, and related, theoretical issues. First, if critical recognition is conceived as a judgment of sorts, we might ask how we know when to engage in the process that renders such judgment. That is, recognition as judgment would seem to present a recursion problem similar to that of the homunculus construct in theory of mind - if criticality itself demands judgment to know when to engage critically, some other dispositional factors must be operative in constituting this tendency toward the critical “meta-reflection” that is required to render such judgment. Thus, one might argue that recognition as judgment gets us nowhere - it simply pushes the conceptual issue one level down.

Equally as damning, we might ask how it is at all possible to conceive of recognition in terms of judgment. For at least *prima facie*, recognition appears conceptually antithetical to judgment – it specifically demands that the thinking required by judgment be left out of the picture. Rather, recognition is more readily viewed as a perceptual process, one that presents a subjective “given” independent of conscious cognition.⁴⁵ Indeed, the connotations of Perkins’s “sensitivity” serve to emphasize this point, as sensitivity toward X suggests merely a reaction to X. In the case of critical disposition, then, one’s sensitivity reaction is the “given” experience of a statement or

⁴⁵ Here, I in no way intend to take a stand on the epistemic character of perceptual “givens.” Instead, I offer the ostensibly benign claim that we generally do not have to consciously think to make sense of our experience, that conscious experience is always-already intentional, infused with semantic substance. The epistemic status of such experience is, of course, a further question, one that has engendered a long history of philosophical and scientific debate.

situation *as* a critical opportunity. It is this “experiencing *as*” that constitutes critical recognition.⁴⁶ And yet, by eschewing a reliance on judgment, sensitivity leaves unanswered how it is that some situations or statements are given or experienced *as* critical opportunities and others are not. Absent such explanation, sensitivity on its own fails to provide the requisite impetus for adopting a critical standard of appropriate questioning.

Earlier, I spoke of the paradox inherent in criticality where in order to render judgment, the critical process ultimately requires an act of “non-criticality.” I questioned whether critical behavior could ever satisfy the demand for justification if we must, for both practical and theoretical reasons, ultimately base critical judgment on uncritiqued (or even uncritique-able) assertion. At this point I offer an answer to that question – we can legitimize the critical-ness of critical behavior by understanding critical recognition as a form of judgment. In the theoretically endless process of iterative interrogation, we reasonably justify the end of interrogation through a process of recognition of critical opportunities, one that itself entails some measure of judgment. That is, some statements should not be questioned because we, in some way, recognize that they should not be questioned - we fail to *see* the need for questioning.⁴⁷ Such recognition, while a form of

⁴⁶ For more on perception and the concept of “experiencing as,” see John Searle’s (Seeing things as they are, 2015) *Seeing Things as They Are*.

⁴⁷ Note that this does not mean that just because an individual fails to recognize a statement or situation as a critical opportunity, they are justified in not engaging critically. Clearly, individuals fail to recognize all sorts of legitimate critical opportunities. In such cases, the recognition-as-judgment thesis would explain such failure as a failure of judgment. Indeed, such less-than-ideal behavior justifies the contemporary call for more criticality. Rather, the warranted end of iterative interrogation assumes a skill

judgment, does not itself entail any conscious thinking - it is instead a perceptual given.

How this might be possible is the subject of the following two chapters.

of recognition that aligns with the ideal of criticality. Critical behavior need not regress infinitely because individuals manifest the standard of criticality through critical recognition.

Chapter 5: The Phenomenology of Criticality

5.1. Criticality as recognition

To be clear, my proposed conception of everyday criticality amounts to two core claims: first, that everyday criticality requires the recognition, or awareness, of interrogative opportunities; and second, that such recognition is a form of judgment. Taken together, the two claims define what I call the expertise conception of criticality. The claims also establish the core goal of this and the next chapter – to articulate the theoretical relation between recognition and judgment so that the former can be understood as the manifestation of the latter. My argument up to this point has laid the groundwork for this task. In claiming that the accepted, though only partially acknowledged, standard of appropriate questioning requires that the “when of thinking” be addressed by judgment rather than motivation or sensitivity, I have suggested that criticality is itself significantly a matter of judgment. And despite my specific critique of sensitivity, I have further argued that Perkins et al. make a substantive case for including recognition in any account of critical disposition. Indeed, my critique of sensitivity is, in some sense, limited to the claim that the concept requires further elaboration to account for the critical standard of appropriate questioning. That I seek to tie judgment to recognition is my attempt to provide this elaboration.¹

¹ It is worth noting that some of the data from Perkins’ empirical studies suggest a link between the ability to use critical skills and sensitivity to critical opportunities, though it seems that none of the groups involved chose to pursue this line of thinking. Linear regression analysis between ability assessment results and sensitivity results led Perkins et al. to associate a one-point improvement in ability scores with a .62 improvement in sensitivity. While this finding on its own merely hints at the possibility of

While Perkins presents both an intuitive argument and empirical justification for introducing the sensitivity construct, there are additional reasons to commit to the centrality of recognition in an account of criticality. These come from the domains of both phenomenology and cognitive neuroscience, where the first-person claims of the former can be substantiated by the third-person perspective of the latter. In this chapter, I limit myself to the phenomenology, presenting the first-person reasons for both committing to interrogative recognition and linking such recognition to judgment. Specifically, I introduce the concept of perceived questionability, arguing that the questionability of experience is itself given as an integral part of an individual's phenomenological landscape. Such questionability forms the first-person basis for critical recognition, as it is the degree of questionability given in experience that accounts for the subjective awareness of critical opportunities. Whether such awareness constitutes justification for interrogative engagement is, as I have argued, determined solely in relation to an accepted critical standard. But the recognition itself is built into the structure of experience.

conceptualizing sensitivity in terms of some sort of judgment, it is surprising that nobody in the Perkins group picked up on its possible import. Here, my hunch is that if recognition of critical opportunities is truly a form of judgment, the same skills needed for critical thinking would be operative in some form during the process of recognition. Conversely, one might at least speculate that the correlation between skills and sensitivity suggests that such skills are utilized in the process of recognition.

Perhaps the most we get on the issue from the various Perkins groups comes from Perkins and Ritchhart, who parenthetically acknowledge the possibility of such a conceptualization. They state: "sensitivity could be called an ability of a sort—the ability to notice—but in our nomenclature ability refers to thinking capabilities once the person is engaged in an effort to think something through" (Perkins & Ritchhart, *When is good thinking*, 2004, p. 359).

There are, thus, two primary goals for this chapter – to elaborate the concept of perceived questionability as the characteristic of first-person experience underwriting critical recognition, and to articulate in phenomenological terms the theoretical link between the experience of critical recognition and interrogative judgment so that the former is understood as the experiential manifestation of the latter. To accomplish this second task, I invoke the expertise theory of Hubert Dreyfus, which postulates the transformation of perception in the process of skill acquisition. When paired with the concept of perceived questionability, expertise theory enables a conceptual elaboration of criticality that overcomes the shortcomings of the motivational and sensitivity accounts. In doing so, I suggest that the expertise theory of criticality provides substantive support for the critical ideal of appropriate questioning.

5.2. Theoretical considerations regarding the use of phenomenology

The value of phenomenological analysis as a method of establishing matters of fact has long been questioned by the scientific community. Something similar can be said of first-person claims about the nature of mind and consciousness, which until recently, had been held in equal, if not greater, disregard. As Lutz and Thompson (2003) note, resistance toward first-person claims in empirical mind, brain, and consciousness research has come from three fronts – the potential inaccuracy of first-person description, the belief that the integrity of first-person experiences is compromised in the act of reporting, and the inability to translate or understand first-person reports in terms of a third-person conceptual (i.e. neural) framework - the so-called explanatory gap. More definitive and comprehensive rejection of the use of the first-person exists as well, with

Dennett, for example, stating that the “first-person science of consciousness is a discipline with no methods, no data, no results, no future, no promise” (Dennett, 2001, *Where's the Program?* section, para. 6). Even proponents of phenomenological analysis have acknowledged its methodological issues, with some bemoaning the lack of adherence to established methodology (Giorgi, 1997; Dowling, 2007), others critiquing the diverse methodological variants themselves (Kakkori, 2009), and yet others eschewing defined methodology entirely (Munhall, 2011). Indeed, to the degree that phenomenological analysis has been accepted as an empirical research method, it has been limited to developing rich descriptions of personal experience based on the common elements of first-person reports - descriptions of, for example, what it means to have experienced loneliness, insomnia, being fired from a job, dropping out of high school, or having survived cancer (see Moustakas, 1994). As such, empirical phenomenology has sought to develop the domain of shared meaning instead of offering claims about the nature of the reality.

For better or worse, such skepticism toward phenomenology suggests the need to clarify and explain one's use of first-person methodology to generate and justify theoretical constructs of mind and experience. Particularly important would seem to be an explanation of the epistemic status and ontological underpinnings of such claims. Are first-person statements about the nature of experience expected to stand on their own by virtue of our direct access to them? What relation do such claims maintain to third-person empirical investigation? And what is the ontological context in which these claims reside – that is, what ontological commitments accompany such first-person

assertions? This last question is particularly fundamental given phenomenology's historical tension with, and rejection of, naturalist ontology.

Regarding my own use of phenomenology in this work, let me begin by noting that the first-person claims I offer in this chapter concern not the shared meaning of specific experience, but matters of fact. That is, in introducing perceived questionability as part of the first-person domain, I offer a general, though perhaps not universal, claim about the structure of human experience. As such, it may seem that I am particularly vulnerable to the epistemic critiques that I have articulated. Two points, however, mitigate such exposure. First, there is a distinction to be made between philosophical phenomenology and what we might call methodological phenomenology.² The project of philosophical phenomenology, from its Husserlian roots, aims to articulate the conditions for the possibility of scientific knowledge and theory (Husserl, 1970; Zahavi, 2003). As such its first-person claims serve both epistemic and ontological functions, providing the foundational justification for scientific method and content. From a purely methodological perspective, the act of engaging phenomenologically demands that we suspend what Husserl termed the natural attitude - the belief, or perhaps assumption, that

² A somewhat related distinction was first made by Husserl (Husserl, *The crisis of European sciences and transcendental phenomenology: An introduction to phenomenological philosophy*, 1970; Husserl, *Phenomenological psychology: lectures, summer semester, 1925*, 1977), who contrasted the ontological commitments of transcendental phenomenology with phenomenological psychology, which he took to be a "regional-ontological analysis which investigates consciousness for its own sake" (Zahavi, *Naturalized phenomenology*, 2010, p. 10). In a similar manner, methodological phenomenology suggests that first-person claims are offered independent of ontological commitments. Specifically, the claims of methodological phenomenology are consistent with, and do not require that we take a position on, the ontological priority of third-person claims. As I shall argue, using phenomenology in this way provides beneficial constraints on, and opportunities for, empirical science.

consciously apprehended phenomena are indicative of a reality external to consciousness. For any such claim directly contradicts the very assumption that underwrites the phenomenological project – that is, that the conditions for the possibility of scientific knowledge and theory are, in fact, at issue. Thus, rather than presuppose that such knowledge concerns an external, mind-independent reality, phenomenological analysis aims, at least in part, to provide a phenomenal ontology, one that views the detailed description of appearances as the ultimate foundation for scientific theorization. As Heidegger states, the goal of phenomenological analysis is to

to let that which shows itself be seen from itself in the very way in which it shows itself from itself. This is the formal meaning of that branch of research which calls itself ‘phenomenology.’ ... But here we are expressing nothing else than the maxim ...: ‘To the things themselves!’ (Heidegger, 1962, p. 34)

The point here is that the “things themselves” are not, as one might think, the things as they presumably exist in a mind-independent reality. Rather, they are the things as they appear to us, absent, to the degree possible, any corrupting conceptual lens. The task of philosophical phenomenology is to articulate those lenses, so that we may separate or “bracket” them out of experience, and justifiably attribute ontological status to whatever remains.

Methodological phenomenology, on the other hand, makes no claim to the ontological priority of first-person claims. Instead, the approach retains the core

assumption of mind-independent reality.³ Its goals are thus, in some sense more pedestrian than that of philosophical phenomenology. Seeking a collaborative instead of competitive relation with scientific inquiry, methodological phenomenology aims to describe, and thus bring attention to, the background characteristics of conscious experience that require explanation (Gallagher, 2010; Zahavi, 2010; Lutz & Thompson, 2003; Dreyfus, 2014) – for example, the sense of ownership that pervades conscious awareness (Gallagher, 2010), the sense of agency that we feel when taking action (Gallagher, 2010; Damasio, 2012), or perhaps more fundamentally, the sense of a unified self (Damasio, 2012; Zahavi, 2005). Such characteristics are the structural constituents of lived experience. They are the pre-reflective⁴ meta-phenomena woven into the fabric of consciousness, the stable, though contingent⁵, conditions that accompany the specific content of an individual's ongoing phenomenal stream. While these background aspects may prove to be mere illusion, in the sense that claims of agency, for example, may

³ From a philosophical perspective, it is important to note that while the methodological variant works within the context of a natural *ontological* attitude, and thus operates “methodologically” under the *assumption* of the natural attitude, it technically refrains from making a particular ontological commitment. As such, methodological phenomenology is ultimately consistent with the larger philosophical project, which views the entirety of scientific inquiry, including the acceptance and utilization of first-person claims, as an abstraction ultimately to be explained in phenomenological terms.

⁴ Here, I ought to note that by pre-reflective, I refer to a conscious mental state or aspect of such a state of which we are not fully aware in the moment. Reflectivity is thus a property of conscious states that pertains to attention. Where reflective aspects of consciousness are those to which give our attention as we experience them, pre-reflective aspects are those that we attend to, if at all, only after having experienced them.

⁵ That this experiential structure is a contingent and not necessary condition of experience is clear from the variety of psychopathologies that appear to manifest radically different experiences of autonomy, ownership, self, etc. Such contingency, in addition, ultimately renders problematic the attempt to generalize from one's own first-person “sense of X.” That said, should the generalization of such first-person claims be contested, empirical phenomenology would serve to validate them.

ultimately fail to survive the growing evidence in support of comprehensive automaticity (see, for example Bargh, 1997; Bargh & Ferguson, 2000; Banaji, Blair, & Glaser, 1997), their existence as a felt and pervasive aspect of experience - as a *sense* of agency, a *sense* of ownership, or a *sense* of self – is, to phenomenologists, not in question. As Gallagher (2010) explains, it is the *seeming* of the experience - the private phenomenal appearance itself - that constitutes reality when it comes to consciousness.⁶

As such, methodological phenomenology treats these first-person claims as raw first-person fact – as data in need of scientific explanation. Or, in the more ambitious phrasing of Lutz and Thompson, the goal is to “to use these original first-person data to uncover new third-person data about the physiological processes crucial for consciousness” (Lutz & Thompson, 2003, p. 32). Regardless of the philosophico-scientific issues surrounding, for example, the ostensible free will of human behavior and cognition, methodological phenomenology acknowledges that the very *sense* of such agency as an integral part of lived experience demands explication. And the same can be said about other structural first-person components.⁷ To dismiss such data because their assumed empirical deficiencies would simply limit the explanatory value of any resulting theory of mind and/or consciousness. As Zahavi states, “phenomenology addresses

⁶ cf. Dennett (Consciousness explained, 1991), who explicitly takes issue with this claim.

⁷ That such claims require explanation assumes that they are accepted as shared and generally universal components of experience. But this assumption is itself potentially contentious, particularly when considered from a positivist epistemic perspective. That said, to deny the existence of such meta-experience is to embrace a form of eliminativism (see below) that is difficult to justify in light of both the fundamental pull of intuition and the potential theoretical impact of excluding such data.

issues that are crucial for an understanding of the true complexity of consciousness and might even offer a conceptual framework for understanding the mind that is of considerably more value than some of the models currently in vogue in cognitive science” (Zahavi, 2010, p. 8). Indeed, this attitude toward first-person claims in the domains of theory of mind and cognition has not been limited solely to phenomenologists, with both prominent cognitive neuroscientists (see Damasio, 2012; Dehaene, 2014; Panksepp, 2005) and analytic philosophers of mind (see Searle, 1997) advocating the need to treat first-person experience as scientific explananda.

Those questioning the scientific viability of first-person claims, however, have taken a position similar to that of Dennett (2001), who in characterizing a first-person science of consciousness as “fantasy” rejects the epistemic value of any theory arising from such claims. The issue can thus be framed as a question about the limits of scientific explanation, where unless one goes so far as to reject the existence of felt first-person experience – the “what it is like” of conscious happenings - it is difficult to avoid the conclusion that there exist some phenomena beyond the purview of scientific explanation. Indeed, this is precisely the approach taken by Dennett and other eliminativists when it comes to acknowledging the existence of first-order phenomenal experience. In doubling down on the epistemic comprehensiveness of scientific methodology, they are willing to dismiss the need to account for what appears to be most basic and incontrovertible - lived experience itself.

Beyond the intuitive primacy of first-person experience and the potential theoretical deficiencies resulting from skepticism toward first-person claims, there exists

an empirical argument for embracing the epistemic stance of methodological phenomenology in theory of mind – the nascent success and clear promise of empirical consciousness research. Indeed, I would argue that first-person detractors like Dennett need to reassess their comprehensive rejection of first-person methodology in light of such success. While I shall delve into the details of empirical consciousness research in Chapter 5, it is important to note here the integral role of first-person claims in helping to legitimize a field of study long viewed as theoretically impervious to empirical research. As articulated by Dehaene (2014), the success of empirical consciousness studies is a byproduct of three recent methodological and technological developments – the advent of high-resolution fMRI brain images, an operational definition of consciousness articulated as “awareness of X”, and the use of first person reports of such awareness. These reports, according to Dehaene, are “the key phenomena that a cognitive neuroscience of consciousness purports to study... [and] constitute primary data that need to be measured and recorded along with other psychophysiological observations” (Dehaene, 2014, p. 43). Such data are then correlated with fMRI scans to determine the large scale neural analogs of conscious awareness. The results of these correlations have been used to support at least two promising explanatory constructs of consciousness theory, Edelman’s concept of re-entrance (Edelman, 2003) and Baer’s global workspace (Dehaene, 2014). Whatever the theoretical limitations of first-person claims, their integration into the empirical inquiry of mind and consciousness has already yielded fruit enough to warrant excitement about future consciousness research. Such promise, as we will see in more detail in

Chapter 5, offers further reason to adopt a more accommodating attitude toward the use of the first-person methodology.

My own claims of first-person matters of fact thus sit within the ontological and epistemological context defined by methodological phenomenology. As such, I offer them as first-person empirical data in need of theoretical explication by research domains devoted to the empirical study of mind - in particular, cognitive neuroscience. While this stance, as stated, assumes a sort of primacy of first-person phenomena - in that it may suggest that we view them as epistemic “givens” to be accepted at face value - it is important to note that proponents of methodological phenomenology advocate a bidirectional interaction between first-person claims and third-person findings (Zahavi, 2010; Gallagher, 2010). Such interaction entails not only that scientific constructs account for the results of phenomenological analysis, but that the outcome of scientific inquiry itself may require that we “take another look at the phenomenology, in order to ascertain whether we got it right the first time” (Zahavi, 2010, p. 8; see also Varela, 1996; Damasio, 2012, particularly p.195). Such a view illustrates a tension between the commitment to phenomenological analysis and its application to a mode of inquiry that prioritizes third-person claims – each method dictates a constraint on the other precisely because it seeks to affirm a degree of epistemic priority. Ultimately, this tension is a byproduct of the explanatory gap that exists between the first and third person perspective, where the naturalist ontology of scientific inquiry presents a seemingly intractable confrontation with the intentionalist paradigm of phenomenology. Despite this confrontation, the need to account for the full complexity of subjectivity as well as

the current promise of an eclectic approach warrant that we make every effort to flexibly navigate the problems created by such a gap.

Indeed, Kiverstein (2012) has sought such flexibility by articulating a commitment to what he calls a “soft naturalism,” one that rejects science as the sole ontological arbiter in favor of a requirement that phenomenological ontology *cohere* with our best scientific explanations. Such coherence, which Kiverstein terms the “Muggle Constraint”⁸, demands solely that “if a philosopher posits the existence of an entity or process that finds no echo in our best scientific theories, the philosopher must concede that the entity or process in question doesn’t exist” (Kiverstein, 2012, p. 28).⁹ In exchange for such constraint, the soft naturalist accepts phenomenological contributions to ontology “precisely because [she] recognizes the potential of a science to operate with a partial understanding of being that often hides and obscures from view other equally valid ways of understanding being” (Kiverstein, 2012, p. 34). As such, soft naturalism seeks to provide metaphysical warrant for the possibility of a constructive dialog between cognitive science and phenomenological analysis, one where first- and third-person domains can both legitimately contribute to and constrain ontological development.

⁸ Muggles are the wizard population in the Harry Potter book series. As such, the Muggle Constraint playfully rejects the “magic” implicit in non-coherence with scientific claims.

⁹ While Kiverstein’s soft naturalism attempts to navigate the gap between first and third person epistemology, it is not without problems. While my point here is not to critique the proposal, I might note that the phrase “no echo” is ambiguous enough to warrant an explanation that Kiverstein omits.

5.3. Perceived questionability and the phenomenology of criticality

Despite my critique of sensitivity, I have made it clear that Perkins et al. have presented both a viable *apriori* argument and promising empirical data to justify the need to account for critical recognition in any elaboration of critical disposition. In this section, I would like to offer an additional reason for doing so – our lived first-person experience¹⁰. In much the same way that sense of agency, sense of ownership, and sense of self have been articulated conceptually as aspects of meta-phenomenal experience open to empirical neurocognitive inquiry (Damasio, 2012; Gallagher, 2010), I want to suggest that there exists a subjective sense of epistemic acceptability – what I have elsewhere called perceived questionability (Fisherman, 2014a). Like these other phenomenologically articulated concepts, perceived questionability, or PQ, is a structural element of human consciousness, one that can account for our first-person experience of interrogative recognition. As such, perceived questionability is an omnipresent, though often pre-reflective, awareness that accompanies first-order perception. Such experience includes both linguistic and non-linguistic instances, as when we hear an assertion from a friend or when we see a bird on the horizon. In these cases, we experience a pre-

¹⁰ The phrase, “lived experience” has long been part of core phenomenological discourse. In light of the tendency to utilize the phrase without elaboration, I refer to Lutz and Thompson’s articulation: “... ‘lived experience’ comprises pre-verbal, pre-reflective and affectively valenced mental states (events, processes), which, while not immediately available or accessible to thought, introspection and verbal report, are intransitively ‘lived through’ subjectively, and thus have an experiential or phenomenal character. Such states, however, are (i) necessarily primitively self-aware, otherwise they do not qualify as conscious (in any sense); and (ii) because of their being thus self-aware, are access conscious in principle, in that they are the kind of states that can become available to thought, reflective awareness, introspection and verbal report, especially through first-person methods” (Lutz & Thompson, 2003, p. 36)

reflective degree of felt attraction or resistance to accepting what has been said or otherwise experienced, an affective meta-experience whose character signals whether we ought to accept or reject a claim or perceived situation.¹¹

In its positively valenced manifestation, perceived questionability is expressed as a measure of felt confidence or trust in the acceptability of a claim or situation. To varying degrees, such confidence forms our lived baseline attitude toward experience, allowing us to cope with the immediacies of our interaction with the world. Thus, we navigate around the table without any thought that we might instead choose to ignore its presence, maintaining a background confidence that what appears before us is as much of an obstacle to walking straight as it seems to be. Similarly, we trust the veracity of the vast majority claims we encounter in our everyday life, accepting statements such as “We’re on our way to the movies” or “Adrian just published her first novel” without pausing to consider the possibility that they may not express the speaker’s real intent or might otherwise be false. For any such claim, there are of course, instances where we do engage this possibility. But these almost always form a small minority of the possible opportunities to engage in this way – and for good reason. To extrapolate from James’s statement that I offered earlier, there would be no more miserable a human condition than to lack this general trust in perception. Indeed, such a default sense of epistemic

¹¹ For the sake of simplicity, I shall use the term “claim” from this point on to refer to both linguistic and non-linguistic experiences. While I do not wish to suggest that we can conflate the two, there is a sense in which an epistemic stance toward a perceived situation equates to a position that concerns a linguistically articulable claim about the situation.

confidence would seem to be a precondition for the development of habit so valued by James.

That said, there is a contrary manifestation of perceived questionability, one that we experience as a degree of resistance to accepting a claim. Such resistance is itself experientially multifaceted, as it may be expressed either as some measure of confidence that a claim or experience should not be accepted, or as a contrasting lack of confidence either way. Thus, we might manifest a felt resistance to accepting the claim that black people are inferior to Caucasians as confidence in the statement's negation. On the other hand, we might hesitate to accept our friend's assessment that the bird on the horizon is a turkey vulture not because we believe it to be a hawk, but because its appearance lacks sufficient clarity to confirm such a determination. In this case, resistance is experienced not as a distinct confidence that the statement ought to be rejected, but as a lack of confidence - as a neutral doubt over its truth. And yet, the specifics of the affective response do not detract from the fact that in both situations, there is a felt resistance to accepting the relevant claim.

While I have described perceived questionability in terms of the contrasting feelings of epistemic confidence and resistance, one might argue that it is more accurate to conflate the two. In this case, we might describe the first-person experience simply in terms of degree of resistance, where epistemic confidence correlates to absence of resistance. Indeed, the very phrase "perceived questionability" suggests this sort of description, as it is the lack of questionability that amounts to confidence. One might also point to the pronounced asymmetry in the two extremes of felt acceptability, where

the generally distinct, well-bounded, and punctuated character of resistance is rarely present in the case of epistemic confidence. Perhaps such asymmetry of experience is a matter of relative frequency, where given a continuous baseline level of confidence and trust engendered by an epistemic framework that enables the successful navigation of physical and social environments, moments of felt resistance naturally “pop out.” Or perhaps one might note the evolutionary benefit of associating an affectively salient experience with potential epistemic challenges. Regardless of the reason, the fact remains that such asymmetry exists to the point where it is not unreasonable to question the phenomenological accuracy of postulating a positive and distinct experience of epistemic confidence. Such confidence, at best, exhibits a low-level intensity that borders on the non-existent, a lack of salience that makes it difficult to reference as a distinct aspect of meta-experience. As such, we might find it more appropriate to describe the experience of acceptance as an absence of questionability.

To some degree, though, the issue is rendered moot when we frame perceived questionability in the context of interrogative recognition. Such recognition has little to do with experiences of confidence or trust and everything to do with the felt resistance to acceptance. Whether epistemic confidence ought to be acknowledged from a phenomenological perspective bears little effect on the fact that interrogative recognition requires that individuals experience at least some felt resistance to accepting claims or experiential interpretations. And such experience is not itself contentious given its punctuated salience. We experience a distinct feeling of resistance to some subset of claims and experiences, and that feeling is the initiation critical recognition. Perhaps

there is more to such recognition, some developing articulation of the dimensions and complexity of the experience that might involve classically conscious deliberation. But the moment of recognizing that there may be something epistemically contentious is, at least from the phenomenological perspective, characterizable as a moment of affective resistance.

However moot the issue, I would still maintain that there is a proactive, assertive character to the experience of seeing a turkey vulture on the horizon or hearing a claim that “just seems true,” a character that extends beyond a mere absence of resistance. There is a moment of experienced identification or confirmation, some degree of lived “this is the case” that actively encourages epistemic acceptance. Sometimes we are sure, sometimes not so sure. But the degree of certainty that we experience does not seem to be felt as simply a corresponding absence of resistance to acceptability. It is instead felt as a moment of active confidence, whatever its degree of perceived salience.

Given my description of interrogative recognition as an affective experience of epistemic resistance, it is important to emphasize the felt nature of perceived questionability. While it may ultimately be I who am epistemically confident about, or resistant to, a claim or situation, there is a “givenness” to the experience of questionability. This is not the givenness of empiricist epistemology, a givenness that is taken to underwrite the knowledge of some independent state of affairs. Rather, it is a phenomenological givenness, where questionability is thrust upon consciousness without a sense that it is a product of intentional decision-making or action. From the point of view of the subject, perceived questionability is like first-order experience in that it

“happens to us” – it is sensed instead of decided.¹² As such, it carries with it a distinctly perceptual quality, one that ostensibly fails to exhibit the cognitive content. It is an experience of epistemic judgment, but one that lacks the conscious cognition associated with such judgment. Put simply, it is a decision made for us, a judgment rendered without the experience of judging.¹³ And this is precisely the reason that it makes sense to speak of *recognizing* interrogative opportunities. In everyday situations we generally do not engage conscious interrogative judgment. Rather, particular claims and situations appear *as* interrogative opportunities because the affective resistance to acceptance manifests as an integral component of the experience. That is, the experience itself exhibits a greater-than-threshold level of questionability.

While perceived questionability and sensitivity are two attempts to highlight the need to account for critical recognition, others have presented concepts that similarly emphasize the role of perceptual recognition in the process of epistemic judgment. Haidt (2012; see also Burton, 2016), for example, invokes Howard Margolis’s (1987)

¹² This is precisely how Vansieleghem (Philosophy for children as the wind of thinking, 2005) describes the deep doubt and perplexity that constitutes her “wind of thinking” – as a happening-to-us, as something from without that forces us to rework our primary epistemic assumptions and patterns of thought.

Indeed, as a happening-to-us, questionability is very much like first-order experiences such as seeing red. Here, the experience of red-ness projects the red-ness to the object itself, as something that exists external to us. And yet, if physics and biology are right, the experienced red-ness is a construction of mind. For the only red-ness that exists external to mind are colorless light waves of a particular frequency.

¹³ Here it is important to note that such a claim exemplifies the use of phenomenological bracketing. Clearly, there is reason to at least entertain the possibility that determinations of questionability require an act of judgment by the subject. However, phenomenological analysis reveals that such belief is not suggested by the experience of questionability itself, but is an element of cognitive theory. Once we isolate or “bracket-out” such elements from what is actually given by the conscious experience, we can see the justification for characterizing perceived questionability as judgment without a judge.

distinction between “seeing-that” and “reasoning-why” to explain why individuals adopt ostensibly unreasonable beliefs, proposing that perception is favored over reason to the point that individuals utilize reasons not as elements of a deliberative process leading to judgment but as rationalization for what has already been perceived as being true. And both Biesta (2011) and Vansieleghem (2005) argue that the possibility of cognitive natality – of engaging new ways of thinking – requires an epistemically interruptive experience, something that “embarrasses us, that puts us into doubt, that confuses us and causes perplexity” (Vansieleghem, 2005, p. 27). Here again, it is the experience itself, not any thinking about the experience, that is responsible for doubt or confusion. In calling such an experience the “wind of thinking,” Vansieleghem seeks to describe a process where the clearing out of existing thought patterns not only begins with a lived experience, but forgoes any cognitive contribution.

Dehaene comes one step closer to articulating perceived questionability itself when he briefly engages the phenomenology of metacognition. In defining metacognition as “knowing the limits of one’s own knowledge” (Dehaene, 2014, pp. 247-248), Dehaene specifies that we not only assign degrees of “belief or confidence to our own thoughts,” but that such assignment involves an inherently affective response. He states:

...crucially, in humans a smaller perceptual distance [between two different frequency tones] also elicits a second-order feeling of lack of confidence. When the sound is too close to the boundary, we realize that we face a difficulty. We feel unsure [whether the second tone is higher pitched or not], and we know that our decision may well turn out to be wrong. If we can, we bail out, openly reporting that we have no idea of the correct answer. This is typical metacognitive knowledge: I know that I don’t know. (Dehaene, 2014, p. 248)

Here, Dehaene's description, though phrased as a felt lack of confidence, is quite similar to the epistemic resistance that I described in cases of uncertain experience or not knowing. While his articulation is more limited in scope than perceived questionability, his use of the word "crucially" suggests that he views it as an inherent aspect of epistemic cognition, part of the structural fabric of experience. Most interesting, Dehaene presents this elaboration not just as an exercise of experiential analysis, but in the context of elaborating the scientific evidence that other high-functioning animals engage in similar, though more rudimentary, metacognitive behavior. Like my approach to perceived questionability, Dehaene expects phenomenological description to be backed up by the empirical data.

Valerie Thompson (2009) turns such phenomenological description into an empirical construct quite similar to perceived questionability, though she does so in the context of reason and problem solving instead of critical questioning. Termed "feeling of rightness," or FOR for short, Thompson defines the construct as the metacognitive experience that accompanies intuitive, or heuristic, answers to posed problems. As supported by empirical studies (Thompson, Turner, & Pennycook, 2011), a strong FOR response "is the reasoner's cue to look no further afield for the answer" (Thompson, 2009, p. 175) while a weak FOR increases the likelihood that the subject will experience a "judgment of solvability" – that is, a metacognitive assessment of the problem's difficulty. While she acknowledges the lack of research regarding metacognitive processes in the domain of reasoning and problem solving, she references the substantial related literature in memory recall to speculate that FOR is the felt experience of

retrieving heuristic output. Retrieval that is processed fluently should thus be experienced as “right,” while more effortful, less efficient retrieval should be felt as less likely to be correct.¹⁴

Perhaps the most closely related concept, though, comes from Dewey, who speaks of the personally sensed disequilibrium (Dewey, 1938) or “feeling of a discrepancy, or difficulty” (Dewey, 1910, p. 73) that precedes, and provides impetus for, critical inquiry. Such a state, Dewey claims, lacks the cognitive content demanded by inquiry. Instead, it presents affectively “as a shock, as emotional disturbance, as a more or less vague feeling of the unexpected, of something queer, strange, funny, or disconcerting” (Dewey, 1910, p. 74). Dewey even employs the language of both sensitivity and perceived questionability to emphasize the need to cultivate interrogative recognition, stating that

If germinating powers are not used and cultivated at the right moment, they tend to be transitory, to die out, or to wane in intensity. This general law is peculiarly true of *sensitiveness to what is uncertain and questionable*; in a few people, intellectual curiosity is so insatiable and that nothing will discourage it, but in most its edge is easily dulled and blunted. (Dewey, 1910, p. 33, emphasis is mine)

¹⁴ Here, I might emphasize that Thompson equates FOR with the processing involved in retrieval of the heuristic response, which one would suppose is different than the processing resulting in the heuristic response. Why retrieval and not the fluency and efficiency of the response processing itself is responsible for FOR is left unstated, but perhaps such questions are better accounted for in the memory and recall literature. That said, I want to further speculate that Global Workspace Theory, which I cover in some detail in Chapter Five, might offer an answer to both this question and the source of perceived questionability.

This statement itself says little about the affective character of interrogative recognition. But taken with Dewey's description of first-person experience, sensitiveness to what is uncertain and questionable very much approximates the phenomenological articulation of perceived questionability. Indeed, unlike Perkins' sensitivity construct, which applies to a conception of good or critical thinking, Dewey frames the issue specifically in terms of criticality, as a response to questionability rather than the recognition of a thinking shortfall. On the other hand, it is surprising just how much the statement approximates Perkins' the articulation of sensitivity. In addition to utilizing the same term, it hints at the "more is better" critical ideal. While such a commitment is not itself explicit, the fact that Dewey describes the pedagogical problem as dulled curiosity and contrasts it to insatiable inquisitiveness suggests that more questioning defines the interrogative ideal. As such, my earlier criticism of Perkins applies just as much to Dewey – that is, neither recognizes the gap between what can be taken as an interrogative opportunity and what ought to be taken as one.

5.4. Expertise theory - linking critical recognition to critical judgment

As articulated, perceived questionability offers first-person support for conceiving of criticality as an act of interrogative recognition. Through the phenomenological description of epistemic confidence and resistance as the affective poles of a structural aspect of first-order experience, perceived questionability affirms the existence of a moment of critical recognition, a moment where a claim is perceived as questionable. And yet, the question remains how such recognition could be understood as an act of critical judgment, as demanded by our standard of criticality. Again, I want to approach

the issue from the perspectives of both phenomenology and cognitive neuroscience, with the expectation that, despite the seemingly intractable gap between the physical and the phenomenal, the third-person claims of the latter can provide material justification for first-person description.¹⁵ While I leave the brain science to the next chapter, I offer in this section a phenomenological explanation in the form of Hubert Dreyfus's expertise theory. Drawing on Merleau-Ponty's (2013) phenomenological concepts of maximal grip and the intentional arc, Dreyfus offers a five stage model of expertise development that details the transition from explicitly conceptual judgment – that is, judgment based on the conscious evaluation of well-defined mental representations – to judgment that is rendered concretely in perception itself.¹⁶ Though the theory has been applied pragmatically to address the pedagogical demand for expertise in a diversity of fields (Benner, Tanner, & Chesla, 2009; Dorst & Reymen, 2004; Paterson, Higgs, & Wilcox, 2006; van Manen, 2008), Dreyfus intends the theory as an argument against the representational theory of mind. It is in this latter vein that the theory applies to my conception of criticality, where it lends some measure of legitimacy to the idea that judgment can be rendered as a perceptual given without any need for conscious

¹⁵ I ought to make clear that Chalmers's (1995) so called "hard problem" of theory of mind does not preclude the use of brain science to support phenomenal claims. While the hard problem defines an explanatory gap for which the current empirical paradigm has offered little hope of a bridge, the non-controversial concept of supervenience - which states that any change in mental state requires a change in physical (brain) state - allows for a measure of explanation through correlation between reported phenomenal states and quantified neurological states. Even in the absence of any idea how the physical might explain the phenomenal, supervenient correlation offers the possibility of theoretical insight that has pragmatic ramifications. As I will argue later, the empirical support for perceived questionability and expertise theory justify specific pedagogical ramifications of an education for criticality.

¹⁶ To be clear, I take perception to include non-phenomenal aspects of experience.

cognition. As we will see later, however, the theory does maintain significant practical ramifications for a pedagogy that nurtures criticality.

Dreyfus' theory of expertise describes the essential characteristics of each stage of skill development, from novice to expert, and articulates the conditions necessary for an individual to advance between stages (Dreyfus, 1988; Dreyfus, 2002). In the novice stage, an individual introduced to a new skill is instructed to act according to a set of "context-free" rules. Dreyfus offers two examples to illustrate this starting state of skill acquisition, those of the novice car driver and the novice chess player. In both cases, the neophyte is given a set of rules for action that does not require any judgment of situation. The driver is told, for example, to shift from first to second gear when the speedometer reads twenty miles per hour, while the chess player is given a set of point values for each piece on the board and told to take the opponent's piece whenever that action will result in a greater loss of points for the opponent. As the individual gains experience, she begins to notice aspects of the activity that dictate additional rules, rules that inherently depend on perceived characteristics of a situation. Such rules are inherently less precise and universally valid than the initial context-free rules, and involve some sort of recognition and categorization of situational specifics. For the driver, this might mean shifting gears based on the sound of the engine after having recognized that traveling on an incline generally puts more of a strain on an engine than traversing a flat surface. Similarly, the chess player might learn to avoid overextending her position after experiencing situations where capturing pieces according to point value resulted in losing

other, more valuable pieces later in the game. This contextual rule development is the hallmark of what Dreyfus terms the advance beginner stage.

With the development of a plethora of context-specific rules, the individual is faced with a developing problem - judging which potentially conflicting aspects of a complex situation should be prioritized. Such a problem defines the stage of competence. The competent chess player must decide whether to exploit the perceived weakness of an opponent's king defense or defend against his own recognized vulnerability. Similarly, the driver must choose whether to prioritize getting to an appointment on time over driving safely. In either case, adopting a goal and a subsequent plan of action enables the actor to manage the number of rules that govern decision-making. The chess player can focus solely on offensive action, while the driver, for better or worse, can focus on traveling as fast as possible at the expense of not passing on the right.

According to Dreyfus, competence defines a turning point in the process of skill building. For the first time, the performer must decide for herself what perspective to take on a multifaceted situation, and hence what set of rules to follow. The relative inexperience of the competent actor forces her to make a conscious, perhaps calculated, decision among a perceived set of options. As Dreyfus notes, there are

more situations than can be named or precisely defined, so no one can prepare for the learner a list of what to do in each possible situation. Competent performers, therefore, must decide for themselves in each situation what plan to choose without being sure that it will be appropriate in that particular situation. (Dreyfus, 2002, p. 369)

In other words, there exist no rules to determine which perspective, and consequently which goal or plan of action, to adopt. Instead, the actor must decide through trial and

error. He may wing it, engage in “a calculative procedure” (Dreyfus, 2002, p. 371), or utilize a combination of both. However, without previous experience, the choice of any plan or goal is always the outcome of a conscious decision among perceived alternatives.

It is important to highlight the difference between Dreyfus’s use of the term “competence” and our common understanding of the term. The stage of competence is defined by the need to judge, not by the success of one’s judgments. The competent actor may fail to achieve a goal but is viewed as competent simply by virtue of having made a choice about how to respond – a choice not required of the advanced beginner. On this account, we would expect the competent performer to fail often throughout the competence stage, as potentially errant plans are invoked for numerous types of newly encountered situations. Yet, the successes and failures of the competent actor play a crucial role in the progression of skill development, for as Dreyfus claims,

prior to this stage, if the learned rules didn’t work out, the performer could rationalize that he hadn’t been given adequate rules...Now the learner feels responsible for disasters...Successful plans induce euphoria, while mistakes are felt in the pit of the stomach. (2002, p. 370).

Despite the hyperbolic overtones of the statement, Dreyfus’s point seems ultimately reasonable. Given some measure of care for acting successfully, individuals faced with decisions about how to act are likely to experience emotional reactions to judgment that are not part of the lived experience of an individual who is merely following the rules. I would even argue that this way of phrasing the claim understates the issue, for while the rule follower might react emotionally to the outcome of her actions, it is simply not possible for her to have such a response *to her judgment*. Such judgment, by definition,

begins with competence, and is thus not something to which the advanced beginner can respond.

This affective component of skilled action provides the requisite foundation for the next two stages of skill development - proficiency and expertise. Each of these stages describes a transition from explicitly deliberative judgment and action to progressively more intuitive behavior, with proficiency addressing how one interprets a situation and expertise defining how one chooses to respond to it. Dreyfus claims that the competent actor achieves proficiency only when situational interpretation, or perspective adoption, becomes a matter of perception - when instead of consciously figuring out what is important about a situation, “certain features... stand out as salient and others [will] recede into the background and be ignored” (Dreyfus, 1988, p. 28). Thus, what was to the competent actor a set of articulated situational considerations whose relative importance could be determined only through a process of (good or bad) reasoning becomes to the proficient performer an integrated and holistic aspect of perception - a skill-specific perceived perspective or “seeing as.”¹⁷ It is this perception that affords the proficient actor well-defined opportunities for response (Greeno, 1994; Scarantino, 2002).

¹⁷ A similar, though perhaps stronger, claim is offered by John Searle (Seeing things as they are, 2015), who proposes that all seeing is a “seeing as.” What is interesting about Searle’s claim is its phenomenological overtones, which is unusual for a committed analytic philosopher.

As Dreyfus explains, emotionally committed skill engagement is essential to making this transition, as it is such commitment that enables the genesis of the affective assessment of action:

If, as the learner practices her skill, events are experienced with involvement, the resulting positive and negative experiences will strengthen successful responses and inhibit unsuccessful ones. The performer's theory of the skill, as represented by rules and principles, will thus gradually be replaced by situational discriminations accompanied by associated responses. Proficiency seems to develop if, and only if, experience is assimilated in this atheoretical way and intuitive behavior replaces reasoned responses (Dreyfus, 2002, p. 370).

While this statement extends beyond the perspective adoption of proficiency to include the transition to intuitive response, it illustrates how competence signals the turning point in skill development. In forcing the involved, or “caring,” actor to consciously prioritize recognized aspects of experience, competence enables an emotional component to find its way into the learning process. Affect becomes the skilled mode of judgment assessment, offering the competent actor an out from the progressively more involved, and hence cognitively burdensome, deliberation that results from continually enhanced perceptual discrimination.¹⁸ Rather than consciously weigh the relevance of an increasing number of factors that influence interpretation of a complex situation, the caring actor ends up getting progressively better at simply “seeing” what is important about it. Previously experienced situations evoke past perspective adoption that was judged to lead to

¹⁸ This is precisely the burden described by both James and Willingham (see Chapter 2), and is the reason why a normative articulation of criticality ought not to demand that we question everything.

successful responses – that is, to responses accompanied by the positively valenced feelings of success.¹⁹ In this way, perspective adoption occurs without any use of a consciously calculative procedure.

A similar process is at work in the transition to expertise. In intuitively adopting skill-relevant perspective, the proficient actor may see what needs to be done, but must still decide how to do it. Such a decision, like the perspective adoption decision faced by the competent actor, requires deliberation, as the proficient actor is incapable of intuiting the appropriate course of action. The expert, though, has responded to a significantly greater number of lived situations and thus intuits not only perspective, but response.²⁰ Here again, continually revised feelings of success and failure govern the transition from the deliberate to the intuitive, offering a mode of response assessment that does not involve comparison to some explicit representation of ideal skill execution. The result of

¹⁹ It is important to distinguish here between what is merely descriptive and what is explanatory. In defining the transition from competence to proficiency, Dreyfus seeks to describe what actually happens – a movement from deliberative and conceptual perspective adoption to transformed perception. But he also quietly introduces explanatory statements, as when he states that “if, as the learner practices her skill, events are experienced with involvement, the resulting positive and negative experiences will strengthen successful responses and inhibit unsuccessful ones” (Dreyfus, 2002, p. 370). Statements such as this one go beyond mere description, and provide the basis for Dreyfus’s support for a non-representational theory of mind. Yet these are the very claims that representationalists would find contentious, regardless of the viability of the descriptive elements of the theory. (See, for example, Fodor, *LOT 2: The language of thought revisited*, 2008; Aydede, 2015)

²⁰ Here, one might ask why intuitive perspective adoption requires less skill than intuitive response. While the first-person descriptive character of expertise theory obviates the need to provide an answer, Dreyfus does offer an explanation. He states that “this is inevitable since there are far fewer ways of seeing what is going on than there are ways of responding. The proficient performer simply has not yet had enough experience with the variety of possible responses to each discriminated situation to respond automatically” (Dreyfus, *Intelligence Without Representation – Merleau-Ponty’s critique of mental representation: The relevance of phenomenology to scientific explanation*, 2002, p. 371).

the process is the perception of an obvious response, one whose appropriateness is not determined through conscious deliberation. Such a response, as Dreyfus explains (above), constitutes one aspect of the individual's current ideal, or theory, of the skill, an ideal that is experienced only as a felt disposition to respond to particular circumstances in particular ways.²¹

While Dreyfus defines additional stages of skill acquisition (see Dreyfus, 2008), the stages up to, and including, expertise describe a path that makes clear the transition from conceptual to perceptual decision-making. In its most concise articulation, expertise theory specifies that this transformation occurs by engaging in the caring practice of a skill. Where the behavior of the novice practitioner is governed by externally imposed rules, the skill acquired through caring practice manifests, in part, as increasingly discriminated skill-specific perception. Such perception forces a change in the way that we approach the assignment of situational relevance as the number of factors perceived to influence perspective adoption and, ultimately, response exceeds the capacity of deliberation. Indeed, at the point of competence, expertise theory postulates initiation of a virtuous "feed-forward" loop, where affective assessment of success nurtures the perceptual discrimination of judgment while enhanced perceptual discrimination itself refines one's feeling (and thus ideal) of success. It is this

²¹ While it may be obvious that Dreyfus is not advocating a type of behaviorism, I want to avoid any misinterpretation of behavioristic terms such as "situation" and "response." Indeed, the phenomenological rendering of expertise theory precludes any affirmation of behaviorism. Rather, the theory offers consciousness -specifically affective consciousness - as the mental construct responsible for modulating environmental input.

progressively refined felt judgment that allows the grandmaster chess player to fare well against one hundred simultaneous opponents, that allows the professional quarterback to know where to deliver the ball amid the chaos of a pass play, and that governs our ability to drive safely in heavy traffic. In each of these cases, the ability to render expert judgment is substantially expressed as an awareness or recognition that is absent in the lived experience of the non-expert.

We might look at perceived questionability as a critical skill subject to a similar developmental trajectory. Here, I do not mean to suggest that expertise theory applies to the very existence of interrogative recognition itself. For clearly, such recognition exists prior to the active or demanded search for questions, as evidenced by the plethora of “whys?” and “hows?” emanating from young children in the course of everyday activities. Indeed, the fact that perceived questionability is a defining feature of our experiential topology forecloses the possibility of utilizing expertise theory to explain the genesis of interrogative recognition. Rather, the skill of interrogative recognition, like all skills, concerns the approximation of a standard or ideal. And in this case, the standard is an interrogative one - the ability to recognize questions when they ought to be recognized.²²

²² This brings up an interesting point about Dreyfus’s use of the term “expertise.” For Dreyfus, expert behavior is not defined as optimal skill, but as intuitive response. While the two very often go hand-in-hand, Dreyfus is clear that one might have acquired expertise in doing something particularly “wrong” from the point of view of an accepted skill. Such expertise, Dreyfus claims, is a product of affective self-assessment, where the actor’s standard of assessment differs from the accepted standard, from “the traditional practices of a community” (Wrathall, 2014, p. 11). This point bears direct relevance to the issue of criticality as a skill, where the ability to recognize questions when they ought to be recognized is the

This is the skill of criticality, the development of one's existing "faculty" of interrogative recognition so that it aligns with our critical ideal.²³ Here, expertise theory is a natural fit. Regardless of an individual's baseline tendency to interrogate claims, we can articulate Dreyfus's stages of skill development to show how the caring practice of questioning utilizes repeated and iterative acts of conscious interrogative judgment to transform an individual's critical discrimination - their perceived questionability - to approximate an adopted standard. What that standard is, how widespread its adoption, or how much it varies are legitimate issues that may make it difficult to see criticality as a skill. But as I have said all along, that such a standard exists is not in question. We may not all agree about which claims and experiences ought to be questioned, but we are all held to some standard of critical behavior. And it is this standard that defines criticality as a skill.

As such, we might concretely elaborate the application of expertise theory to criticality in the context of critical thinking development, which as I argued earlier, is

ideal defined by the practices of a community – in this case (as I argued in Chapter 2), the educational community.

²³ We might view the relation between criticality and interrogative recognition in much the same way that the skill of pitching relates to throwing a ball. While throwing is both a necessary condition and fundamental activity of pitching, a toddler can throw without having any skill at pitching. In the same way, criticality is a skill such that the mere ability to recognize a claim as questionable fails to impart any measure of criticality to an individual. Such is the case because, in the same way that pitching concerns, not throwing, but retiring a batter, criticality fundamentally concerns not just interrogative recognition, but the approximation of a critical ideal – knowing when and when not to interrogate. Without any ability to approximate the ideal, interrogative recognition itself fails to impart a measure of criticality.

inherently interrogative.²⁴ Given the contemporary call for more questioning, critical thinking pedagogy seeks to increase one's critical recognition so that more claims are seen as questionable. With this in mind, the novice critical thinker is initially given a set of context-free critical thinking rules, some of which articulate criteria for interrogation. Foremost among these would likely pertain to the need to offer reasons (Siegel, 1988) – criteria such as “accept a statement if someone offers a reason for doing so” and “accept a statement as true if and only if you find more reasons that it is true than false.”²⁵ As the thinker gains experience using these rules and finds reasons to interrogate more,²⁶ she begins to notice aspects of dialog, written text, and situational experience that suggest the contextually relative strength of reasons. She develops, or may be instructed to use, an assortment of context-sensitive rules such as “in cases where there are acknowledged experts, give weight to their claims.” At the point of competence, she will have learned to discriminate numerous factors contributing to the relative strength of warrant – the trustworthiness and authority of the source, the import of the statement, her own recent

²⁴ Here, I intend this application of expertise theory to criticality to be understood as illustrative, not as a rigidly proscribed means of skill acquisition. As Mark Wrathall (Hubert Dreyfus and the phenomenology of human intelligence, 2014) notes, Dreyfus himself has emphasized the need to view the theory flexibly, expecting that different skills and environments would dictate a variety of possible variants of the described path to expertise.

²⁵ While this may, at first, sound like an unreasonable rule for coming to judgment, students in my kindergarten and first grade “philosophy with children” classes have often articulated just such a rule. After listing the reasons for accepting or rejecting the claim that “Frog and Toad were brave,” children will frequently note that their final judgment was based on the number of reasons in each list.

²⁶ Note that it is reasonable to think that individuals will question more in this situation only if we assume two things – that approximation of the standard requires that the individual generally question more, and that the standard is something toward which the individual strives. The first is a claim I offered in Chapter 2, and the second amounts to Dreyfus's requirement for involved or caring practice.

and not-so-recent experience, how the assertion comports with her belief system, and so on. Here, our thinker is forced to judge which of these aspects ought to be prioritized and which can be ignored. For example, she might prioritize that her friend is not much of a dog expert over her friend's trustworthiness, thus leading her to question his claim that no dogs have different colored eyes. This intentional judgment of situation – a decision forced upon our thinker by her improved capacity to discriminate situational complexity – places responsibility for either engaging or foregoing critical interrogation squarely on her shoulders. Such responsibility, initiates a transition to the affective assessment of judgment, leading our thinker to *feel* the impact of her interrogative decisions – in this case, satisfaction upon learning that border collies typically do have mismatched eye color.

As our thinker *feels* the results of repeated and involved interrogative decisions in the context of progressively more taxing deliberation, feelings of satisfaction and dismay replace reason as the standard of interrogative assessment. In the presence of such assessment, explicit deliberation over questionability fades, replaced by a reconfigured tendency toward felt epistemic confidence and resistance. Claims that in the past might not have been perceived as questionable now evoke a resistance toward acceptance, while claims previously perceived as questionable might no longer appear as such. Of course, in the presence of a standard of questionability that demands more interrogation, we would expect more frequent manifestations of resistance and correspondingly fewer experiences of confidence. And the same might be said in the inverse. Given a standard of appropriate questioning, those overly disposed toward interrogation would tend to

have the interrogative needle moved in the other direction, from experiences of resistance toward epistemic confidence. What we get in both cases is an alignment toward the standard, an acquired ability to act in a manner defined by a sought-after ideal. Such alignment constitutes, by definition, the development of criticality.

5.5. Revisiting criticality as a form of judgment

Toward the end of chapter three, I presented two substantial problems with a conception of critical recognition as a form of judgment. First, I wondered how a process of judgment could explain interrogative recognition without begging for further judgment in order to account for the need to determine when it is appropriate to judge whether or not we should interrogate. Such an explanation, I proposed, would initiate a regressive loop that promised to raise as much of a question as it proposed to answer. Second, and perhaps more importantly, I noted the difficulty of characterizing a perceptual event as a form of judgment given the traditional opposition of perception and conception. With both issues, I believe there is much in the domains of cognitive neuroscience and contemporary consciousness research that offers potential solutions – and I will get to these in the following chapter. However, it is just as important to understand the degree to which such issues are addressed by the phenomenology itself – that is, by the concept of perceived questionability and the application of expertise theory.

Indeed, it is not immediately clear that expertise theory *does* justify a conception of interrogative recognition as a form of judgment. For while the theory describes a learning process where the caring practice of explicitly conceptual judgment fosters the transition to intuitive decision-making that aligns with previous assessments of critical

response (and non-response), it is not obvious that such decision-making can itself be characterized as a type of judgment. Rather, it seems to have the character of a learned behavioral response more along the lines of habituation than judgment. Dreyfus, himself, facilitates this view when he states that in the development of expert behavior “the performer’s theory of the skill, as represented by rules and principles, will thus gradually be replaced by situational discriminations accompanied by associated responses” (Dreyfus, 2002, p. 370). If this is the case, it is difficult to see any opening for judgment, as responses would seem to be judgments only to the degree that they follow from some form of considered evaluation of alternatives. And in a model of behavior where responses merely accompany situational discriminations, no such evaluation would seem to be operative. Indeed, it is characteristic of expert behavior that only one response presents – the perceived “right” one.

Perhaps we might find a role for judgment in the act of situational discrimination, of deciding that a situation is of a certain type. Given the proposed mapping of response to situation, judgment of situation would then be tantamount to judgment of response.²⁷ But here, too, the phenomenology of expertise theory is clear - there is no decision to be

²⁷ This is precisely the form of Bechara’s Somatic Marker Hypothesis (Bechara, The role of emotion in decision-making: Evidence from neurological patients with orbitofrontal damage, 2004; Bechara & Damasio, The somatic marker hypothesis: A neural theory of economic decision, 2005), an empirically justified decision-making theory that gives a key role to affect. While I will not discuss this theory in Chapter Five, it bears mentioning here given its use of a judgment map. According to SMH, the brain develops a mapping between previous judgments and the lived emotional responses to those judgments. The mapping is then invoked in the process of making a decision, with the brain unconsciously searching among the “database” of previous judgments to find those situations that it judges to be similar to the current one. After aggregating similar situations, the brain initiates what Bechara calls an “as-if” emotional response intended to provide decision-making guidance for the current situation.

made. Situations are perceived not conceived, and skilled performers simply perceive more – more detail, and hence more situational distinctions. Here, we might suggest the possibility that despite the lack of judgment in first-person experience, some form of judgment of response, or even of situation, is necessary “under the hood,” as part of an encapsulated and inaccessible process. This might very well be the case, and we will explore this possibility in the next chapter. But there is little evidence in the first-person perspective to support such a view. To the degree that the performer is an expert, the phenomenology of both the discriminated situation and the response maintains the character of an experiential given.²⁸

Indeed, the most that the phenomenology itself justifies is a view of criticality as what we might call the “embodiment of judgment.” As we have already seen, both the classically cognitive assessment integral to nascent skill development and the affective assessment of proficient or expert response are acts of judgment. In the case of the latter specifically, its felt character is the result of an implicit comparison between a skilled response and the actor’s non-representational theory of the skill. But rather than being a mere judgment of previously rendered response, expertise theory claims that all such assessment bears a direct effect on future response, where the “positive and negative experiences will strengthen successful responses and inhibit unsuccessful ones” (Dreyfus, 2002, p. 370). In a very concrete way then, response assessment is a temporally

²⁸ I would further argue that to the degree that third-person empirical studies justify an “under-the-hood” process that does rely on the evaluation of alternatives, any suggestion that the first-person data does not warrant such a process illustrates the limits of phenomenological analysis. Such a position is consistent with, and a ramification of, a methodological approach to phenomenology.

bidirectional judgment, one whose backwards vector evaluates a past response and whose forward vector issues a judgment for future situations. Given its concern with the future, the forward vector necessarily takes the form of a conditional similar to, though not generally as definitive as, “if this situation presents, this is the way I ought (not) to respond.” Such judgment, rendered repeatedly for ever-more-finely discriminated situations constitutes the means by which particular responses pair with defined situations, thus constituting the skill-related “dispositions to respond to the solicitations of situations in the world” (Dreyfus, 2002, p. 367).

To the degree that we commit to articulating some concrete attribute of the individual that accounts for this pairing, we can thus justifiably see its relation to response assessment as something more than causal. For it is not merely that such assessment causes the development of the attribute. Rather, it causes a particular kind development – one where the attribute “incorporates” the assessments, where its character is such that the future tendency toward critical engagement becomes progressively better aligned with the assessments of past interrogative decisions. Whether assessment conditionals can be said to exist as distinct constituents of the attribute depends on its elaboration as something more than a “black box,” a process that may very well be empirical in nature. But even as a black box, the fact that future behavioral output progressively matches past assessment input lends justification to a description of the attribute as an instantiated amalgam of conditionally formulated judgments previously rendered. As such, we might say not only that criticality is a

product of judgment, but that the act of critical recognition is itself the embodiment of judgment.

It is this last claim, in particular, that addresses the weakness of the sensitivity conception. As I discussed in Chapter 3, sensitivity exists as a response to the failure of motivation to account for the “when of thinking,” for the need to apply critical skills at the right time. But in saying little about what is involved in such application, the concept propagates the very issue it was meant to address - it leaves us asking what it is about the critical spirit that enables it to engage critique when it ought to be engaged. At this point, though, we would seem to have our answer. Critical individuals exhibit appropriate critique because they have embodied good critical judgment. That is, they have developed a personal attribute - a virtue - whose implementation manifests the meta-judgments of the past in the critical recognition of the present. This is not to say that in exhibiting appropriate critical behavior, individuals engage in an *act* of critical judgment in the moment - though as we will see in the next Chapter, there is reason to believe that critical recognition is just such an act as well. Rather, it is that whatever process underlies the decision to engage or forgo critique has been instantiated in a manner that abides by the conditionals of past critical assessment.

Yet one might argue that such a process is better conceived as a manifestation of habit. For in establishing a tendency to respond, the development of expertise, like our common sense notion of habit, specifies the pairing of perceived situations with responses, so that situations S1, S2, and S3 tend to produce response R1. James himself formally defined mental habit in this manner, stating that “our thinking and feeling

processes are also largely subject to the law of habit, and one result of this is a phenomenon which you all know under the name of 'the association of ideas,' (James, 1925, p. 37) where "certain ideas... are always followed by certain other ideas" (James, 1925, p. 41). Like Dreyfus, James emphasized the role of repetition in the development of such association. Habit, he claimed, "becomes effectively ingrained in us in proportion to the uninterrupted frequency with which the actions actually occur, and the brain 'grows' to their use" (James, 1925, p. 33). As such, James advocated the need for repetition in education, so that we might "make automatic and habitual, as early as possible, as many useful actions as we can, and as carefully guard against the growing into ways that are likely to be disadvantageous" (James, 1925, p. 32).

Similar characteristics define the mental functioning underlying expert response. Dreyfus, like James, never doubts the presence of lived experience, but it maintains little role in the production of expert behavior. The expert chess player lives the experience of a "right" move, but as Dreyfus describes it, there is little gap between the experience and the execution. The expert is "geared into" the world, so that the response is executed without the need for deliberation or even mental representation. It happens as a purely dispositional response set up in advance, one already tuned to a diverse set of environmental complexities. As such, expertise bears an unmistakable resemblance to Jamesian association. Situations present and responses tend to follow, without mediation.

There is, however, a crucial difference. If expert response were truly habit, it should be the case that repetition always reinforces the tendency toward a particular situation-response pair. Indeed, I would suggest that such an understanding of habitual

development is not merely part of articulation offered by James, but a core characteristic of our common sense understanding. Actions are habits precisely because the repeated pairing of situation and response has rendered the response the dominant behavior in the specified situation.²⁹ Expertise theory, though, does not hypothesize this straightforward relation between repetition and dominant behavior. While repetition is a necessary condition for the development of expertise, it does not mandate the reinforcement of the situation/action pairing. That is, the mere repetition of action A in situation S does not necessarily increase the likelihood of responding with A in future S situations. Rather, expertise theory postulates that the tendency toward A in future S situations is dependent on one's affective assessment of the execution of A after the fact. Contrary to increasing the likelihood of responding with action A in the future, a negative assessment of A in situation S is hypothesized to inhibit the A-S pairing. Unless one defines habit as solely a description of the tendency to behave, and not as a comment on the type of mental functioning that underlies the behavior, there is reason to conceive of expert response as something other than habit. Indeed, where we might view habit as the instantiation of previous action, embodied judgment is the instantiation of previous judgment.

Finally, I should note the striking similarity between criticality as the embodiment of judgment and Dewey's conception of critical disposition as "habit." As I explained in

²⁹ Stated this way, habit is not just a term describing a pattern of behavior. It is a comment on the nature of mental functioning, one that specifically rejects the need to define an intervening mental construct or process to explain such patterns.

chapter three, Dewey acknowledges the difficulty of articulating the dimensions of the concept, stating that

... we need a word to express that kind of human activity which is influenced by prior activity and in that sense acquired; which contains within itself a certain ordering or systematization of minor elements of action; which is projective, dynamic in quality, ready for overt manifestation; and which is operative in some subdued subordinate form even when not obviously dominating activity. Habit even in its ordinary usage comes nearer to denoting these facts than any other word. If the facts are recognized we may also use the words attitude and disposition. (Dewey, 2007, pp. 40-41)

Unlike the affectively motivational conception of critical disposition, which postulates “will” as the source of one’s tendency toward critical engagement, Dewey’s statement expresses a conceptual complexity that positions critical disposition somewhere between the extremes of unconstrained autonomy and reflexive, habitual behavior. Such is also the case for the expertise conception of criticality, which similarly affirms both willful and habitual aspects. Indeed, I would suggest that the entirety of Dewey’s articulation applies to the expertise conception. Expert criticality is “influenced by prior activity and in that sense acquired.” It “[orders the] minor elements of action,” is “ready for overt manifestation,” and is “operative in some subdued subordinate form.” It further affirms a similar role for attitude. In accepting “attitude” and “disposition” as legitimate, though qualified, descriptors of critical disposition, Dewey suggests an agentic, willful element to a type of action that is acquired, dominant, and default. Expertise theory hypothesizes this role for will in two ways – first by proposing that the individual’s theory of the skill is rendered merely as a disposition, or *tendency*, to respond; and second by emphasizing the centrality of care in the development of skill acquisition. In this way, expertise theory

not only hints at a role for will in the moment of critical opportunity, but it brings attention to its more dominant role before the moment as well.³⁰

5.6. The remaining challenge

While a phenomenological account of criticality founded on perceived questionability and expertise theory may justify a view of criticality as embodied judgment, it fails to provide evidence for the stronger and potentially more contentious claim that critical recognition is itself an act of judgment. As I hinted at earlier, support for this claim requires more than just first-person description - it requires that we delve into the black box of criticality and explore the possibility that there is something operating under the hood of conscious critical experience. Here is where an inquiry into existing neurocognitive theory has something to offer. Though the material basis for cognition and consciousness leaves numerous fundamental questions on the table, this is the first time in history where our understanding of neural structure and function is such that we can turn to the structure and function of the brain to explain the specifics of cognition. This is not to say that we ought to commit definitively to the claims of extant neural theory. However, to the degree that such theory is empirically justified, we might use our current neural understanding of cognition as an opportunity both to further

³⁰ A similar articulation of the varying relation between motivation and habit is offered by Nieto and Valenzuela (*A study of the internal structure of critical thinking dispositions.*, 2012), who offer empirical evidence for the diminished role of motivation in critical disposition over time. One might also interpret Nieto and Valenzuela's hypothesis along the lines of expertise theory, where motivation is the care that catalyzes intuitive judgment.

substantiate our first person claims and gain insight into the ramifications of the fact that not all cognition is phenomenologically experienced.

Chapter 6: Cognitive Science, The Frame Problem, and Criticality

6.1. Introduction

As discussed in the previous chapter, methodological phenomenology defines a symbiotic relationship between phenomenological analysis and empirical research and theory. Rather than pursue the comprehensive first-person ontology of philosophical phenomenology, the methodological variant seeks to articulate the detail and richness of first-person experience as data in need of further explanation. It was in this vein that I introduced perceived questionability as a structural component of experience that explains the possibility of critical recognition. Similarly, while I invoked expertise theory in part to justify criticality as embodied judgment, the theory itself is a model of phenomenological description that, in detailing the first-person characteristics and transitions of expertise development, begs for further explanation. Dreyfus himself hints at such a need, stating, for example, that “proficiency *seems* to develop if, and only if, experience is assimilated in this atheoretical way and intuitive behavior replaces reasoned responses” (Dreyfus, 2002, pp. 371-372, emphasis is mine). For in using the phrase “seems to,” he qualifies the epistemic import of the claim in a manner that invites other modes of inquiry to contribute to its confirmation. Or, as Dan Zahavi (2010) might phrase it, he indicates an openness to revising the phenomenology in light of findings from other modes of inquiry.

The current chapter addresses this demand for further explanation and confirmation by delving into the domain of cognitive neuroscience. In large part, the chapter mirrors Chapter 4, providing third-person analogs for the previously articulated set of first-person claims. Specifically, I seek to show that there exists at least one empirically promising cognitive architecture that offers third-person support for the expertise conception of everyday criticality as elaborated by perceived questionability and expertise theory. Most important is that such an architecture back up my two-pronged commitment to criticality as a form of judgment, particularly with regard to the as-yet-unjustified claim that critical recognition is itself an act of judgment. Here is where I expect the science to offer particular benefit, as it suggests an empirically validated cognitive architecture that justifies just such a claim.

That said, the nature of this chapter is speculative, and for good reason. First, there has been almost no neurocognitive research on questioning, let alone critical questioning (Berger, 2014).³¹ We are thus left to speculate how existing neurocognitive theory might offer support for the first-person claims of the previous chapter. That said, the broad scope of the cognitive theories I reference in this chapter suggests a natural application to the issue of criticality. As we shall see, the breadth of these theories suggest an architecture and mechanism for cognition in general, thus putting critical questioning in its purview.

³¹ As Berger notes, the research most relevant to critical questioning focuses on divergent thinking. I would add that there is a substantial body of research on hypothetical thinking as well (see Evans, *Dual-process theories of reasoning: Contemporary issues and developmental applications*, 2011), which is also closely related to critical questioning.

Yet, even if we grant the relevance of cognitive theory to the specific issue of criticality, there is a more basic issue at hand - contemporary neurocognitive theory is currently itself a somewhat speculative endeavor. The field has, for years, engaged in several foundational debates, including the role of representations (see, for example Fodor, 2008; Freeman, 2000; Greeno, 1994; Dreyfus, 2002), emotions (Panksepp, 2005; Panksepp, 2014; Damasio, 2012; Thagard & Aubie, 2008), and consciousness (Dennett, 1991; Searle, 1997; Dehaene, 2014; Chalmers, 1995). And differing positions on these issues have produced a diversity of often conflicting theories of cognition. Indeed, we have already experienced the ramifications of some of these debates in the elaboration of criticality presented in previous chapters. And we will need to address them further in this chapter.

Thus, we ought to take the goal of this chapter for what it is – an early attempt to utilize the promise of contemporary theories of cognition and consciousness to understand the critical process, and by extension, critical disposition. I have little doubt that continued empirical inquiry into the workings of the brain will further the current trajectory, minimizing the speculative aspect of theories of mind, both as it concerns our broad understanding of cognitive mechanisms and their application to criticality. Notwithstanding the progress made in the field of brain science since James' *Principles of Psychology* (James, 1890) in the late 19th century, this is perhaps the first time in the history of inquiry into mind where there is substantial empirical evidence to warrant theorization of a brain-based cognitive architecture. It is my intent in this chapter to illustrate how we might harness these efforts to provide support for my earlier arguments.

6.2. Theoretical considerations regarding the use of cognitive neuroscience

In previously articulating a role for phenomenological analysis in the task of understanding critical recognition, I had to address longstanding doubts over the epistemic value of first-person method. To the same end, it is necessary to confront the issue from the other side, to address the *prima facie* primacy of cognitive neuroscience in explaining cognitive functioning. The promise of cognitive neuroscience, in conjunction with the entrenched commitment to materialist ontology, often leads to an outright disdain for other modes of explanation, as exemplified by Dennett's comprehensively dismissive claims in Chapter Four above. So in order to further justify a symbiotic relationship between first and third person methods, it is not only necessary to promote the value of phenomenology but to highlight, and perhaps temper, any overzealous expectations for cognitive neuroscience. This is not to at all diminish the ultimate value of a materialist explanation of cognitive functioning, but to counteract a premature commitment to a reductionist account. Indeed, I am not opposed to the goal of comprehensive physicalist reduction of mind and cognition, but instead am more concerned that it is unjustified at this point in the development of brain science to close the window on interdisciplinary perspective. There is an argument to be made for at least the possibility of a future successful reduction, but it is presently more a matter of faith - or, perhaps more generously, an extrapolation from the current trajectory of the field's development - to assume that the parameters of scientific methodology as they apply to brain science can facilitate comprehensively physicalist accounts of mind and human cognition. This is perhaps especially true in light of Chalmers (1995; 1996) "hard

problem of mind” – the ostensive inability to explain the manifestation of phenomenal experience by reference to the structure and functioning of physical, specifically neural, material.

That said, it seems wholly unreasonable to deny the promise of brain science when it comes to questions of cognition. For one, there is strong commitment, both among scientists and philosophers of mind, to the principle of supervenience – the claim that there is no change in mental state without a corresponding change in physical state.³² While this tenet presents a claim far weaker than one justifying physical reduction, it does articulate a tight binding between mind and the brain, where it would seem impossible to account for mental functioning without reference to neural mechanics. Stephen Campbell articulates precisely this line of thinking to argue for the need to embrace cognitive neuroscience in educational research. He states:

...changes in subjective experience must in principle manifest objectively in some manner as changes in brain, body, and behavior, and vice versa. Placing the details of causality and the nature of matter aside, this radical view of the embodied mind (viz., the mindbrain) warrants a search for correlations between subjective experience and embodied behavior. If we wish to study subjectively experienced changes in the mental states of learners, one promising avenue in so doing is to study changes in brain and brain behavior. (Campbell, 2011)

Here, it is important to note the care Campbell exhibits when speaking of the relation between subjective experience and physical substrate. The supervenient relation is

³² This “mental-specific” formulation notwithstanding, supervenience is a general principle applicable to a variety of domains. As a general principle, supervenience entails that B-properties supervene on A-properties if and only if a difference in B-properties requires a difference in A-Properties (McLaughlin & Bennett, 2011).

merely one of correlation between lived experience and the brain, and Campbell is right to place “the details of causality and the nature of matter aside” given the epistemic difficulties presented by these stronger relations. But as Campbell makes clear, even mere correlation warrants the need to direct inquiry toward the brain.

Furthermore, there is historical reason to believe that cognitive neuroscience offers the potential for unparalleled explanatory success. As Weinstein has argued, despite the missteps, competing theories, and fundamental disagreements that characterize the current state of the field, three meta-epistemological hallmarks characterize the development paradigmatically successful scientific enterprises (Weinstein, 2002; Weinstein, 2011; Weinstein, forthcoming; Fisherman & Weinstein, 2015). Such disciplines produce theories that are supported by a converging body of evidence of increasing scope and detail. These theories both subsume an expanding set of diverse explananda and are themselves increasingly explained by higher-order frameworks that connected them to other similarly characterizable theories in the domain. Termed consilience, breadth and depth, these features offer an assessment not of the content of a field per se, but of its dynamics, its epistemic trajectory. They paint a picture of an expanding web of relations between a growing core of data and the theories and frameworks that explain them. It is this increasingly detailed and hierarchical web that, independent of the specific theories and debates defining contemporary cognitive neuroscience, warrants our confidence in the discipline.

Despite these arguments, there are those who have sought to minimize or even dismiss the value of brain science. Catherine Malabou (2008), for example, has critiqued

the concept of brain plasticity, arguing that in equating plasticity to adaptability and flexibility, cognitive neuroscience has unwittingly injected a measure of “ideological drift” into its account of human cognition. Malabou focuses on her own formulation of the hard problem – not the gap between the physical and the phenomenal per se, but what she refers to alternatively as the transformation or transition of the neuronal to the mental.³³ Neuroscientists, she claims, fail to appreciate such a gap, instead postulating a naive and uncritiqued “continuity” between the two domains, a continuity that reinforces a socio-political view of individuals as obedient and docile. This continuity, Malabou says, results from an anemic concept of plasticity, where development of the mental amounts to an adaptive response to the environment, as exemplified by the ongoing Hebbian (Hebb, 1949) rewiring of neuronal arrays. Yet for Malabou, brain plasticity is more than adaptation. As she states:

To be flexible is to receive a form or impression, to be able to fold oneself, to take the fold, not to give it. To be docile, to not explode. Indeed, what flexibility lacks is the resource of giving form, the power to create, to invent or even to erase an impression, the power to style. Flexibility is plasticity minus its genius. (2008, p. 12)

Here, Malabou makes clear why the plasticity postulated by neuroscience is insufficient to bridge the gap between mentation and its physical substrate. Plasticity, conceived through the Darwinian lens of neuronal survival of the fittest fails to account for the power of humans to self-create, to shape their own consciousness and cognition. As a

³³ Malabou does not explicitly elaborate her understanding of the mental. But it seems clear to me from the text that “mental” refers to both conscious awareness – that which we experience reflectively – and cognition.

mere response to environmental forces, mental development is “docile,” in the sense that what develops is not, at least in part, of its own making. It is no wonder then that Malabou requires an articulation of brain plasticity that includes a formative and active “resistance to homeostatic constancy” (2008, p. 72), enabling the production of the mental not through mere Darwinian adaptation, but as an “ontologically explosive” (2008, p. 72) act of self-creation. She states:

What results is a tension born of the resistance that constancy and creation mutually oppose to each other. It is thus that every form carries within itself its own contradiction. And precisely this resistance makes transformation [from the neuronal to the conscious] possible. The auto-constitution of self obviously cannot be conceived as a simple adaptation to a form, to a mold, or to the received schemata of a culture. One is formed only by virtue of a resistance to form itself. (2008, p. 71)³⁴

Malabou justifies the invocation of a dialectical account by arguing that the theoretical fissure between the neuronal and mental can be filled only by providing a non-neuronal, non-biological story. Indeed, she claims that the infusion of ideology, in the form of Darwinian adaptation, is a result of having failed to recognize the need for such a story:

By wishing not to construct a hermeneutic schema capable of explaining...the relations between the neuronal and the mental, by wishing not to recognize the necessarily meta-neurobiological dimension of that schema, one exposes oneself, whether one recognizes it or not, to ideological drift – for example, and above all, to that of mental Darwinism or psychological Darwinism. (2008, pp. 64-65)

³⁴ I might note that in referencing “self,” and not conscious awareness or cognition, this passage exemplifies the loose and disparate conception of “the mental” utilized by Malabou. As we will see later in the chapter, neuroscientists, philosophers of mind, and cognitive scientists distinguish between the various potential referents of “mental,” treating each as a distinct, though perhaps related, target of inquiry.

Such a view is tantamount to a substantial rejection of the third-person accounts of neuroscience. For absent the meta-neurobiological component, our understanding of how our consciously cognitive selves come to be is, at best, incomplete – and, at worst, simply wrong. The mental develops from the neuronal not merely through adaptation to one’s environment, but also in the necessary presence of a self-creative force that sits in opposition to it. Neuroscientific accounts of both the development and functioning of conscious cognition thus omit a key explanatory variable, one that endows humans with an agency capable of “unleashing possibilities, of unleashing new ways of living and... new ways to be happy” (2008, p. 67). Indeed, if Malabou’s argument does nothing else, its affirmation of an ontologically primary self-creative force accounts for the sense of agency that characterizes our daily lived experience. That is, we feel our own agency because such agency exists.

Clearly, in arguing that contemporary neuroscience is fundamentally ideological, Malabou offers a bold and radical critique of the field. While she presents much that invites response, an in-depth critique of her views at this point is more of a digression than I wish to engage, particularly in light of my stated commitment to neuroscience. Instead, I want to offer a few comments that illustrate the problems one encounters when questioning the value of neuroscience as an enterprise. On the one hand, it is important to acknowledge the current intractability of the physical/phenomenal gap defined by the hard problem of mind. And it is also the case that scientists often have glossed over the issues that make the hard problem hard (see, for example Damasio, 2012; Kaku, 2014; Dennett, 1991). However, neither issue on its own or together, warrants that the

physical/phenomenal gap need be filled by a meta-neurobiological account. Chalmers (1995; 1996), for example, has committed to a naturalist account of phenomenal consciousness despite arguing that a science limited to describing structure and function is likely to be theoretically incapable of providing such an account. In this case, rather than relying on a non-scientific or meta-scientific account, Chalmers suggests that a new paradigm of scientific description – one that continues to be empirically based – must be embraced. Malabou, however, argues that the only way to fill ostensibly physical/non-physical gaps in a manner that avoids “ideological drift” is to leave the domain of the empirical itself. We might compare this to Weinstein’s criteria of depth, which, while it accepts the need for a hierarchy of theoretical explanation, does not postulate that such an explanation be non-scientific. To the contrary, Weinstein’s depth criterion requires that any meta-account be part of the enterprise itself (Weinstein, 2002).

Second, and perhaps more damning, it seems clear that Malabou’s motivation for a critique of plasticity is her insistence that brain plasticity must be taken to include a self-creative component. And yet, in proposing this requirement, she begs the very question whether the creation of conscious awareness and cognition requires any more than Darwinian adaptation. The “genius of plasticity” may, in Malabou’s understanding of it, require more than adaptation, but she offers little reason for taking a position on a question that has long remained questionable.³⁵ From the perspective of neuroscience,

³⁵ Here, it is important to note Malabou’s socio-political motivation for insisting the self-creative aspect of plasticity. Much of “What Should We Do with Our Brains?” elaborates a mirroring relation between the ideology of anemic plasticity and contemporary socio-political structure where the broad and

one could very well argue that the drive to view plasticity – and the type of conscious self that arises from it – through the lens of Darwinian adaptation is merely an application of Occam’s razor. That is, to the degree that adaptation can ultimately account for the specifics of our modes of awareness and cognition, there would seem to exist little need for adding anything more to the story. Of course, whether more is required is still a matter of inquiry, but to insist that it is needed to explain our sense of agency would seem to beg whether it is indeed required.

On the other hand, we might argue that Malabou simply misrepresents the neuroscientific understanding of plasticity. For whether or not agency is required, there is empirical evidence that the brain significantly bootstraps its own consciousness. As Dehaene explains,

Autonomy is the primary property of the nervous system. Intrinsic neuronal activity dominates over external excitation. As a result, our brain is never passively submitted to its environment but generates its own stochastic patterns of activity. (Dehaene, 2014, p. 189)

As we will see later in this chapter, intrinsic neuronal activity often manifests consciously, at which point it maintains a tangible effect on neuronal development. The

unwarranted application of evolutionary adaptation has allowed us to make a virtue of adaptive flexibility in everyday social and political life. Indeed, Malabou suggests that we have been taken by evolutionary adaptation to the point where we see ourselves as mere reactions to the existing environment. Thus, as an answer to the book’s guiding question, she claims that recognizing the self-creative nature of plasticity will enable us to confront a socio-political system that promotes docility and endurance over agency. As she states: “To ask ‘What should we do with our brain?’ is above all to visualize the possibility of saying no to an afflicting economic, political, and mediatic culture that celebrates only the triumph of flexibility, blessing obedient individuals who have no greater merit than that of knowing how to bow their heads with a smile” (Malabou, 2008, p. 79)

resultant developmental loop suggests that neural plasticity is not merely adaptive but creative as well.

Damasio further critiques the opposition of agency and adaptation, arguing that conscious behavior is governed not by the direct constraint of homeostatic maintenance, but by the broader drive for felt emotional well-being. Here, Damasio postulates a proxy role for felt emotions where they act as “the dutiful executors and servants of biological value,” (Damasio, 2012, p. 115). While emotions ultimately function to promote homeostatic maintenance, they uncouple the direct relation between behavioral motivation and adaptation. That is, feelings of well-being are not necessarily those that signal current homeostatic maintenance, but rather perceived long-term organismic success. As such, Damasio allows all sorts of social and personal behavior that may or may not prove beneficial for organismic well-being to fall under the rubric of adaptation. For it is only the combination of the predictive capacity of cognition along with the use of emotion as the measure of biological value that is truly adaptive. Specific instances of behavior do not necessarily promote homeostatic maintenance in their own right. If Damasio’s view is correct, there is little reason to hold adaptive plasticity in opposition to agentic behavior. In being a tool for the promotion of felt well-being, emotion blurs the line between the requirements of adaption and Malabou’s need for self-creation.

While Malabou’s argument targets the basic explanatory value of neuroscience, others have critiqued its applied utility to education. Willingham, who is himself a neuroscientist, has warned against taking an optimistic view of educational neuroscience, arguing that the different levels of analysis required by the two domains makes it unlikely

that teaching and learning can benefit substantially from the claims of cognitive neuroscience. Willingham offers the example of memory to make his point:

So here's the rub: for the sake of simplicity, cognitive psychologists intentionally isolate one component of the mind (e.g., memory or attention) when they study it. But in the classroom, all of the components operate simultaneously. So a principle from the cognitive lab might backfire when it's put into the more complex classroom environment. That's the problem of levels of analysis. Cognitive psychologists study one level — individual components of the mind — but educators operate on a different level — the entire mind of the child. (Willingham, 2008, p. 422)

According to this argument, cognitive neuroscience peddles in the technical specifics of cognitive components, not their holistic interaction. And simply knowing how each component operates is insufficient to generate claims of relevance to education. Thus, Willingham concludes that if we really want to improve teaching and learning, what matters is not the data from the brain, but data from empirical studies that test “what works” in the classroom. While it is theoretically possible for neuroscientists to offer brain-based suggestions that foster the goals of education, Willingham views their work skeptically. As he states, “I don’t believe that there will be many... situations... in which neuroscientists say, ‘Hey, maybe you should try this at school,’ and educational researchers say, ‘Never thought of that!’” (Willingham, 2008, p. 423).

Along these lines, Michel Ferrari (2011) notes that there have been numerous documented cases of “false generalization,” where implementation of neuroscientific lab findings has failed to generate expected outcomes in the classroom. He warns of the “medicalization” of educational issues, urging us to guard “against claiming that the root cause of learning difficulties is a mechanical failure or abnormality that operates at the

genetic or neural level” (2011, p. 33). And in an argument not wholly unlike the one Malabou presents, Paul Howard-Jones (2011) suggests that the tendency of neuroscientific theory to avoid, or even reject, the attribution of autonomy is in direct conflict with the primary theoretical assumptions of education, which at its core seeks to nurture the independence and autonomy of learners. Given the unsettled nature of the autonomy issue, he states that educators ought to be wary of bringing to the classroom findings that minimize, or otherwise ignore, the role of reflexive self-determination in the learning process. Ferrari, too, supports this view, stating that recent findings warrant that “educational neuroscience [ought to] be careful to promote frameworks in which agency is possible and valued” (2011, p. 33).

While Ferrari, Howard-Jones and others (see, for example, Campbell, 2011; Ansari, Coch, & De Smedt, 2011) are quick to warn of the potential pitfalls of educational neuroscience, they do not reject or otherwise seek to marginalize its utility. Rather, they argue that we ought to articulate the parameters of a relationship between neuroscience and education that can harness its potential value. In much the same way that phenomenologists have sought to utilize first-person experience to help define the explananda of empirical science, they advocate a bidirectional, collaborative, multi-disciplinary, and multi-perspective approach to educational neuroscience where educationists help define a research agenda and cognitive neuroscientists help to confirm or reassess existing educational assumptions, understanding, and techniques. Geake elaborates how this might work in his self-labelled “position statement” on the research objectives of educational neuroscience:

... a cognitive neuroscience-education nexus should be a two-way street (Geake, 2004). Whereas cognitive neuroscience could inform education by providing additional evidence that confirms good practice, helps resolve educational dilemmas, or suggests new possibilities in pedagogy or curriculum design, education could inform cognitive neuroscience by providing a source of complementary behavioral data, especially on children, as well as posing new worthwhile lines of investigation. (Geake, 2011, p. 44)

Campbell (2011) argues for more than bidirectional interaction, advocating that educational neuroscience ought to transcend any penchant for strictly third-person, mechanistic explanation to accommodate the ontological commitments that underlie education's goal of improving the lived experience of people. Here, Campbell seeks the integration of the governing conceptual frameworks and methodologies of both domains – education and neuroscience - arguing that

educational neuroscience as a bona fide transdisciplinary activity, by definition, must entail the forging of new philosophical frameworks and research methodologies for variously bridging education and neuroscience, mind and brain, *phenomenological and physiological*, teleological and causal, *first person and third person*, objective and subjective, and so forth. (Campbell, 2011, p. 8; emphasis is mine)

Ferrari takes the position one step further, saying that “educational neuroscience must itself become part of a broader debate about the aims of education and how to help students flourish, understand deeply, and become socially productive members of society” (Ferrari, 2011, p. 35).

Taken as a whole, these positions define goals for, and constraints upon, educational neuroscience that offer a simultaneous acceptance and critique of Willingham's levels of analysis argument. While agreeing that the viability of

educational neuroscience depends upon its ability to engage in analysis both relevant to education, and consistent with its ontological presuppositions, Geake, Campbell, and Ferrari are optimistic that such analysis is possible. Where Willingham sees neuroscience as inherently compartmentalized, these authors envision a research program capable of developing an integrated understanding of cognitive structures. In place of purely mechanistic, causal explanation, they express optimism for theories that account for autonomous cognition, lived experience, and sense of self. In short, contrary to Willingham's characterization of neuroscience, these authors paint a picture of cognitive inquiry capable of transcending its roots to both complement and influence educational theory and practice.

And yet, issues such as autonomous cognition are as open for debate as ever.³⁶ Indeed, Howard-Jones's warning to avoid theories that reject cognitive autonomy offers a case in point. Rather than reference findings that affirm the existence of cognitive autonomy, Howard-Jones offers only the weaker - and I think more defensible - claim that the issue has yet to be decided. Thus, we might ask what happens to the project of educational neuroscience (let alone what happens to the core educational goal of developing individual autonomy) if debates over such topics like automaticity veer toward mechanistic and causal explanation. While some might argue that it is premature to address such hypotheticals, or even that doing so unjustifiably assumes that these

³⁶ See Bargh (The automaticity of everyday life, 1997) and Bargh and Ferguson (Beyond behaviorism: on the automaticity of higher mental processes, 2000), for extensive evidence against such autonomy.

issues can be addressed empirically, the answer to such questions has the potential to make salient those educational commitments that are a precondition for the viability of educational neuroscience.

The specific case of cognitive autonomy is particularly illuminating. Here, I think, it is essential that we distinguish between education's presumption of cognitive agency and its goal of improving the lived experience of individuals. While cognitive autonomy is valued because it is assumed to benefit lived experience, the very statement of this claim designates cognitive autonomy as only a means to the primary aim of improving lived experience.³⁷ And the statement further allows that it is not the only means of doing so. Indeed, I would venture to say that regardless of the final position on the autonomy debate – or, more generally on any phenomenon open to causal explanation - educational neuroscience will have something relevant to say as long as it buys into the primacy of subjective experience and its sensitivity to education. That is, even if agency is ultimately cashed out only as *sense* of agency, there are still neurally-definable variables sensitive to educational intervention that maintain causal relationships to lived experience. Some of these exist independent of autonomy - variables related to literacy and basic mathematics, for example. Others, like those pertaining to internal motivation

³⁷ To be clear, by “lived experience” I mean personal, subjective experience as *felt* by a consciously aware entity. I certainly do not mean material conditions, though I grant that material conditions often have a substantial bearing on lived experience.

By “*improving* lived experience” I mean the perceived improvement of experience over the hypothetical defined by the absence of education. Of course, the reference to a hypothetical entails that individuals themselves are not capable of truly assessing the benefit of education. That is, in not being able to compare our own lives to one without education, we merely speculate that, for the most part, education benefits our lived experience.

and interest, relate directly to autonomy (see Ames, 1992). But even these latter ones do not disappear in the absence of true autonomy. Whether interest or internal motivation is “self-generated” or merely appears that way, it is reasonable to assume that it can be influenced by education. Thus, regardless of the autonomy verdict, these variables would continue to be the purview of educational neuroscience.

When we articulate a symbiotic relationship between education and neuroscience, when we are open to changing the way that neuroscience “does business” within the context of education, we can respond to Willingham’s pessimism about the relationship between the two. Such pessimism, as we have seen, arises from the belief that the disconnect in ways of doing business prevents neuroscience from specifying novel, viable, and substantive changes to the classroom. But in specifying reciprocal constraints – in particular, by requiring that neuroscience accommodate at least some of the presuppositions and goals of education – we no longer require that neuroscience offer such contributions for it to be relevant. Instead, it can assume a supportive, critical, and creative role. As such it would offer both material justification for, and critical insight into, new educational approaches and techniques. This would have the effect of either reinforcing existing educational research to provide multi-disciplinary perspective, or providing reason to hold tentative, or otherwise reassess, our existing beliefs. And it would further act as a springboard for educational practice and theory, facilitating the formulation of new conceptual and practical possibilities in the domains of teaching and learning.

It is with this understanding of educational neuroscience that it makes sense to explore what neurocognitive theory might offer to perceived questionability and the expertise theory of criticality. Indeed, to the degree that such theory might provide material support for, or critical insight into, my claim that criticality ought to be conceived as matter of judgment instead of mere motivation or sensitivity, we might view my approach as an example of educational neuroscience in action – the application of neuroscience to an educationally-relevant position defined and justified in the context of educational philosophy and articulated in first-person language. In this case, education opens a window for a third-person research agenda, requesting a multi-disciplinary perspective on an issue defined by educational theory. On the other hand, we might critique this attempt as a rather weak example of educational neuroscience, as speculating upon extant cognitive theory is a far cry from the tight integration envisioned by Geake, Campbell, and Ferrari. Such a critical stance certainly seems defensible. However, I would suggest that these baby steps invite future neuroscientific research on the issue, research that can put to the test the application of cognitive theory to the specific question of criticality as a form of expert judgment. Given the absence of literature on the neural basis of critical questioning, such a step ought to be taken as an attempt to break new ground.

6.3. What are we looking for?

In turning to cognitive neuroscience for third-person support for the expertise conception, there are a number of specific features of a cognitive architecture that would seem to be essential. Given my claim that perceived questionability is a structural

component of subjective experience, we should hope to find an “always-on” mechanism of judgment, a physically implemented means of evaluating in real time, the epistemic acceptability of experience. Such an architecture should further account for the experience of critical recognition, explaining how, in the context of continuous background judgment, some judgments manifest as part of our conscious, reflective experience. And any such architecture ought to provide a physical explanation of Dreyfusian expertise as it relates to the development of critical judgment. In particular, it must address the hypothesis that the affective assessment of responses determines one’s disposition – that is, one’s tendency, for future response.

Finally, it is perhaps most important that we be able to cash out any physical account of criticality as a form of judgment.³⁸ Central to this task is the issue of critical relevance, the degree to which particular claims and issues ought to factor into a determination of appropriate critical engagement. In the same way that any assertion or situation can be considered a critical opportunity, any number of considerations might be taken as factors when determining whether to engage, or continue to engage, critically. When we suggest that critical engagement is warranted, we thus imply that we have considered the factors relevant to such a determination and have ignored the rest. Indeed, in claiming that judgment is necessary to put a brake on iterative questioning I have, in essence, claimed that we judge additional questioning to be irrelevant to the particular

³⁸ Just to reiterate, in calling criticality a form of judgment, I propose that a) criticality is embodied judgment and b) critical recognition is an act of judgment.

situation. And in invoking expertise theory, I have further suggested that, to the degree we are critical experts in everyday situations, determinations of relevance are folded into perception. That is, we perceive only what is critically relevant.

Thus, we might specify an additional condition for any neuroscientific explanation of critical recognition - it must account for our ability to judge critical relevance in the context of what we might call an “interrogatively unencapsulated”³⁹ environment, an environment where there are no defined brakes on continued questioning. Here again, the issue is both practical and theoretical. Not only must a cognitive architecture address the need to assign critical relevance in a timely manner, but it must explain how such assignment happens at all. For without the assignment of relevance, there would seem to be no way to justify the notion of appropriate interrogation. Either interrogation would cease without reason (though perhaps not without cause), or it would not stop at all.

As such, any account of criticality must address a long-standing problem in theory of mind devoted to the issue of relevance – the frame problem (see Dennett, 1984; Fodor, 1983; Fodor, 1987; Shanahan & Baars, 2005). The frame problem first arose as a practical matter in the field of AI, where a machine entity capable of successfully navigating a complex environment needed to keep track of the changes its own actions effected in that environment. For an entity utilizing representations to map external

³⁹ This phrase is a variant of Fodor’s (Modules, frames, fridgeons, sleeping dogs, and the music of the spheres., 1987) “informationally encapsulated” environment.

conditions, any such change required the robot to update some subset of those representations to reflect the altered state. But knowing which representations needed to be updated proved to be problematic without evaluating each of them.

Dennett (1984) has humorously illustrated this problem by describing the situation of a robot tasked with safely removing a wagon from a room containing a time bomb. Even when the robot is programmed with criteria for determining the relevance of representations to a specific action, the sheer number of statements that require evaluation prevent timely completion of the task. For perhaps it is not sufficient to remove the wagon from the room because the bomb is on the wagon. Or perhaps the bomb is tethered to a taut string, such that moving it in the wrong direction would cause the string to pull the trigger. However pedestrian or eccentric these possibilities may be, there would seem to be no way for a representational system to know which environmental representations were relevant to the action without evaluating each.

Dennett articulates this point in his punchline:

“Do something!” they [the researchers] yelled at it [the robot].

“I am,” it retorted. “I’m busily ignoring some thousands of implications I have determined to be irrelevant. Just as soon as I find an irrelevant implication, I put it on the list of those I must ignore, and”

... the bomb went off. (Dennett, 1984, p. 130)

Such a situation is very much the same with criticality, in two respects. First, as I argued in Chapter 2, the demand for judging interrogative relevance is a matter of practical timeliness, where appropriate criticality demands that we engage iterative interrogation without compromising the need to act promptly in the world. Thus, in approximating the

critical ideal, we must judge when continued interrogation is relevant to evaluating a claim appropriately. Second, this issue of “when to stop” is simultaneously an issue of “when to start,” as it pertains to the initial act of critical recognition. In this case, recognition as judgment requires that there be some mechanism to determine which epistemic commitments bear influence on initiating a critical response. For again, the need for a timely response would seem to render the evaluation of all such commitments untenable.

But beyond the issue of timeliness, the frame problem defines a more fundamental and intractable issue concerning relevance (Shanahan, 2016). While Dennett’s robot faced the unenviable task of evaluating all epistemic commitments in order to determine the subset relevant to the task at hand, it did have at its disposal a set of criteria to determine the relevance of any particular epistemic commitment. Such criteria could be incorporated into the “mind” of the robot precisely because the task for which it was programmed defined those criteria – that is, those tasks were explicitly hard-coded as part of the robot’s purpose, its *raison d’être*. Presumably, such an approach could be scaled up, so that robots capable of handling a variety of tasks could be programmed to maintain sets of such criteria – frames, as they have been called - each of which could be applied to specific situations to determine relevance. But this presents a problem, as the robot would now need to determine which frame was relevant to a given physical situation, thus requiring us to specify second-order criteria to enable such a determination.

That this demand for meta-criteria begins a potentially unending regress becomes evident when we realize that the application of any particular meta-criteria itself requires criteria to determine its relevance to the situation at hand. For what is relevant to any situation depends not merely on its physical features, but on our in-the-moment goals that we bring to it. That is, what is relevant in physically identical situations X and Y may differ given what we seek to accomplish at that moment in time. And determining what we seek to accomplish at a particular time is again based on more encompassing goals – and on and on. The point is, once we accept the need for meta-criteria, we begin a regress that prevents any particular set from acting as *the* source of relevance. For any frame will beg for a higher-level frame to supply the criteria needed to select the relevant lower-level frame from the set of existing ones.

As such, the frame problem appears intractable, in the sense that the application of a frame, at any level, gets us no closer to explaining how we can determine relevance. We might be tempted to claim that at some level in the “hierarchy” of frames, the biological mind simply creates a final mapping, in much the same way as programmers might implement such criteria in a scaled-up version of Dennett’s robot. But it will always be appropriate to then ask how *that* mapping is created. To the degree that we postulate some set of relevance-free rules or criteria as the answer, we are left to either re-ask the question as it concerns those rules or render arbitrary the ultimate source of relevance. As Dreyfus himself notes (2012), the frame problem suggests that it is impossible to inject relevance into any set of epistemic commitments by reference to rule-based criteria. Rather, in order to judge relevance, relevance itself must somehow

already be part of our epistemic foundation, a necessary condition for the possibility of knowing the world.⁴⁰

6.4. Dual cognition theory

With the core requirements of a cognitive architecture articulated, we are set to delve into specifics. Given the need to account for the perceptual character of critical recognition - its sense of “givenness” - it seems appropriate to begin with dual-cognition theory, the idea that the brain has evolved two defined systems or types of cognition. While the conceptual distinction between conscious and unconscious cognitive processes can be traced, through Freud and James all the way back to Leibniz and Descartes, empirical evidence for subconscious cognitive processes first emerged in the 1960s with Arthur Reber’s research on implicit learning (Frankish, 2010). Since then, numerous distinct dual-cognition theories have been proposed to explain reasoning, judgment, and social cognition, each of which distinguishes between two types of cognitive processes: those whose operation is ostensibly automatic and inaccessible, and those to which we have consciously access.⁴¹ Where the distinction was originally articulated by

⁴⁰ I might point out that a similar argument was offered by Heidegger (*Being and time*, 1962) long before the articulation of the frame problem. Heidegger rejected the possibility of relevance-free Being, arguing for an ontology based, not on physical being, but on the care that makes possible human experience. As the ultimate source of relevance, Heidegger’s care provides the criteria by which derivative, rule-based determinations of relevance are made possible.

⁴¹ Over the years, various terms have been used to articulate the distinction. Fodor (*The modularity of mind*, 1983), for example, speaks of the difference between input modules and higher cognition; Evans (*The heuristic-analytic theory of reasoning: Extension and evaluation*, 2006) proposes the “heuristic-analytic” distinction; and Lieberman (*Social cognitive neuroscience: a review of core processes*, 2007) contrasts reflexive and reflective cognition.

postulating two systems of cognition – System 1 and System 2 – Evans and others (Evans, 2008; Evans, 2011; Evans & Stanovich, 2013; Thompson, 2009) have argued that the distinction is more appropriately conceived as being between types of cognitive processes - Type 1 and Type 2 - with a vast and growing amount of empirical evidence suggesting a multiplicity of Type 1 systems.⁴² Indeed, in a review of dual cognition theories, Evans (2008) emphasizes the diversity of proposed Type 1 processes. Some theories, he states, hypothesize the existence of individual innate cognitive modules that implement fully encapsulated processing of perception, language, attention, and other base cognitive functions. Others describe an associative learning system that enables acquisition of implicit knowledge - knowledge that directly affects behavior but cannot be articulated semantically. Still others provide pragmatic support for Type 2 processes, identifying and retrieving explicit knowledge for conscious processing. And perhaps most clearly relevant to expertise theory, some implement fully automated processes that have taken over the function of previously conscious tasks.

In addition to the conceptual evolution from systems to types, the functional, anatomical, and evolutionary characteristics that define each type have changed over time. Where Type 1 processes were initially thought to be uniformly rapid, unconscious, evolutionarily old, contextualized, and uniquely subject to cognitive bias, Type 2 processes were taken as necessarily slow, conscious, abstract, of recent origin, and

⁴² As Evans (Dual-processing accounts, of reasoning, judgment, and social cognition, 2008) notes, the evidence is less definitive on the issue of multiple Type 2 systems.

resistant to bias. Such rigid characterization, though, has faded, with empirical evidence mounting that, among other things, some otherwise Type 1 processes manifest phenomenologically and many, if not most, Type 2 processes contains components that are equally not reportable (Baars & Franklin, 2007). Furthermore, it has been shown that ostensibly analytic and rational Type 2 processes are as equally subject to cognitive bias as purportedly heuristic Type 1 processes, though for different reasons - where heuristic processes fail to cue the relevant information, analytic processes fail to correctly apply the appropriate rules for processing.

Frankish offers a sparser set of oppositional characteristics, defining the distinction as one between intuition and reason, where “the former [is] immediate, quasi-perceptual, sensitive to subconscious cues and sometimes biased; and the latter, [is] slow, effortful, explicit and more cautious” (Frankish, 2010, p. 915). Though Frankish fails to unpack some of the terms in his articulation, he softens the oppositional character of the distinction, avoiding the rigid unconscious/conscious differentiation and acknowledging the possibility that bias affects both types of process.⁴³ Evans similarly strips the distinction of its early attributes, emphasizing a core four. Claiming to present the view currently articulated in the cognitive psychology of reasoning, he describes Type 1 processes as “fast, high capacity, independent of working memory and cognitive ability” and Type 2 processes as “slow, low capacity, heavily dependent on working memory and

⁴³ For our purposes, it is most interesting that Frankish describes intuitive cognition as “quasi-perceptual.” While he fails to further explain what he means here, the term itself seems to suggest something along the same lines as perceived questionability – that there is an element of experienced “givenness” to the products (i.e. the decisions or judgments) of intuitive cognition.

related to individual differences in cognitive ability” (Evans, 2011, p. 87). In this case, it is the use of working memory that does the heavy lifting for Type 2 cognition by accounting for many of its salient characteristics without requiring that they be either exclusive to such processes or wholly determinative of their operation. Features such as conscious accessibility, analytic operation, and perceived resistance to bias can thus be generally attributed to Type 2 processes while allowing that some Type 1 processes exhibit such features while some Type 2 processes lack them.

Beyond distinguishing between types and attributes of cognitive processes, dual cognition theories have hypothesized the relationship between them. In his review of dual cognition theories, Evans (2008) discerns two general types of proposed interaction – parallel-competitive models and default-interventionist models. The parallel-competitive model specifies little interaction between Type 1 and Type 2 processes, elaborating a cognitive architecture where both types are mobilized independently and compete for behavioral influence. Such a model assumes that there exist analogous Type 1 and Type 2 functions, where Type 2 functions render reasoning and behavior-inducing judgment through analytical manipulation of semantically pregnant representations, while Type 1 functions do the same through a semantically empty connectionist architecture – that is, through a mechanistic process best interpreted without reference to semantic content. The default-interventionist model, on the other hand, specifies a relationship whereby Type 1 processes provide default responses that influence behavior only in the absence of a Type 2 override. Here, in a manner consistent with our common sense lived

experience of intuitive response, Type 1 output is sent to Type 2 processes for possible further evaluation.

Both models of interaction suggest the need for adjudication between Type 1 and Type 2 claims for behavioral control. That the parallel-competitive model in particular leaves the issue wholly unaddressed has led Stanovich (2009; Evans & Stanovich, 2013) to propose a tripartite model of mind that further differentiates between Type 2 processes. Rather than speak solely of process types, Stanovich's model distinguishes among types of mind, each of which defines a "level" of cognitive control rather than a single encapsulated system. The model thus postulates three levels of control - an "autonomous" mind consisting of the traditionally-defined Type 1 processes that is in control only of its own functioning; an "algorithmic" mind of rule-based Type 2 processes that maintains inhibitory or override control over what Stanovich calls the autonomous set of systems ("TASS"); and a "reflective" mind that controls the initiation of Type 2 inhibitory processes. As Stanovich explains, the further distinction between algorithmic and reflective processes is designed to reflect the difference between analytical capacity and the classically defined thinking dispositions – precisely the distinction that motivation, sensitivity, and perceived questionability seek to address. While he acknowledges that the similar functional traits of algorithmic and reflective processes will make their distinction less prominent than the Type 1/Type 2 distinction, he offers a variety of empirical data warranting its value – data regarding not only the correlation between cognitive bias and general intelligence, but also concerning types of cognitive breakdowns and psychiatric disorders (see Stanovich, 2009). Indeed, he views

such data as justifying a material distinction between intelligence and rationality, where algorithmic processes implement the former and reflective processes implement the latter.

What might we take from the central claims of dual (or tri) -cognition theory as they relate to perceived questionability and the expertise theory of criticality? Perhaps the implications are already obvious, but we ought to articulate them clearly. Most important, I believe, is that dual cognition theories, particularly those elaborating a default-interventionist model, offer an empirically-based theoretical account of a pre-reflective, inaccessible, and sub-personal cognitive apparatus that provides ready-made content to conscious thought. While such an apparatus does not itself account for an “always-on” mechanism of critical judgment, it does explain the intuitive and affective “givenness” of perceived questionability. In this case, questionability is explained as the Type 1 determinations that are output to Type 2 processes, the latter of which account for our reflective experience, including critical recognition. That Type 1 processes are themselves both sub-personal and inaccessible suggests that our experience of such recognition would be that of a content delivered to consciousness, not something requiring intentional and willed cognition.⁴⁴ And the fact that Type 1 processes are thought to lack semantic content and, at times, manifest affectively is consistent with the

⁴⁴ Indeed, there is an argument to be made that there is a sense in which sub-personal processes are truly what they imply – processes that are not “of the person.” While such an argument would, in the best-case scenario, suffer the typical pitfalls of dualism, it would further justify the sense of givenness experienced during critical recognition.

inarticulate feelings of resistance and confidence that characterize background perceived questionability.

As such, dual cognition theories provide a large-scale framework to support some of the significant characteristics of the expertise conception of criticality, both with regard to its pre-reflective background operation and its reflective manifestation in critical recognition. But the application of a dual cognition principle alone seems to lack the detail to provide a robust account of the cognition underlying criticality, however speculative that account may be. Several core questions clearly remain. Just *how* do algorithmic and/or reflective processes interact with the autonomous mind to account for the perceptual transformation central to the development of expertise? How does the architecture account for the presence and effect of affective assessment in such development? How does it justify a conception of critical recognition as an act of judgment? And finally - perhaps most importantly - how does such a cognitive architecture address the issue of relevance, particularly as articulated by the frame problem? These are all questions whose answers would seem to require reference to a specific theory, though at this point in our material understanding of cognition, one theory alone may not comprehensively address their aggregate scope. That said, there exists a theory with extensive empirical support that, surprisingly, accounts for just about all of these questions. It is called global workspace theory.

6.5. Global workspace theory

First developed by Bernard Baars in the 1980s, global workspace theory (GWT) is a high level and comprehensive dual-cognition theory of consciousness that is

supported by a substantial and expanding body of empirical data.⁴⁵ In being a cognitive theory of consciousness, GWT not only articulates a cognitive role for consciousness, but it postulates cognition as the function of consciousness, its *raison d'être*. Indeed, as Baars and Franklin conclude, consciousness “allows us to deal with novel or challenging situations that cannot be dealt with efficiently, or at all, by local, routine unconscious processes” (Baars & Franklin, 2007, p. 958). And as Dehaene argues, data collected from empirical neurocognitive and consciousness research point to one core conclusion - that “we need to be conscious in order to rationally think through a problem” (Dehaene, 2014, p. 108). A similar position has been advocated by others not directly associated with GWT. Evans (2011), for example, has claimed that consciousness is essential to hypothetical thinking, allowing us to generate inferences from events yet to be realized. And Michio Kaku (2014) calls human consciousness a simulation machine, one that “creates a model of the world and then simulates it in time, by evaluating the past to simulate the future” (Kaku, 2014, p. 46). While these views utilize slightly different language to describe the purpose of consciousness, they all describe the same functional role – consciousness enables us to rationally contemplate the future. Where unconscious processing facilitates judgment about the present based on the past, conscious processes grants us the ability to utilize the past and present to formulate predictions about what is yet to occur.

⁴⁵ See Dehaene (Consciousness and the brain: Deciphering how the brain codes our thoughts, 2014) for a detailed account of the extensive empirical data that supports GWT.

Global Workspace Theory, however, articulates a highly circumscribed definition of consciousness, where to be conscious of X is to be aware of X. Though “awareness of” is no doubt a central condition of consciousness, such a definition leaves unaddressed a fundamental component of our common-sense conception – the phenomenal or qualitative character of consciousness.⁴⁶ For awareness of X does not, at least logically, entail phenomenal manifestation. Rather, it requires only the recognition of experiencing X – or, perhaps more accurately, of simply becoming cognizant of some piece of information (Dehaene, 2014, p. 21).⁴⁷ As such, GWT has been said to assume a functional definition of consciousness, one where, regardless of phenomenal manifestation, a conscious agent utilizes its awareness of distinct states of affairs to accomplish real-world tasks (Baars & Franklin, 2007).⁴⁸

I should emphasize, though, that the functional definition is not intended as a reduction of consciousness. Both Dehaene (2014) and Baars and Franklin (2007) refer to it as an “intermediate” concept, one that enables the scientific study of consciousness in

⁴⁶ We might compare this highly-specific definition of consciousness to Malabou’s broad and loose use of the term “mental.” I would suggest that a significant part of the problem with Malabou’s argument can be traced to the ambiguity inherent in her use of this term. Indeed, as Dehaene (Consciousness and the brain: Deciphering how the brain codes our thoughts, 2014) emphasizes, it is the narrow scope of “consciousness” that has contributed to the viability of empirical consciousness research.

⁴⁷ Here, it bears mentioning that I intend the phrase “awareness of X” to equate to “awareness that X.” While the former suggests awareness of objects, it is more accurate to speak of awareness of a state of affairs – a nuance entailed by “awareness that.” I continue to use “awareness of” because, the Dehaene comment notwithstanding, the empirical GWT literature more often speaks of recognizing objects rather than states of affairs.

⁴⁸ I might note that it is the perceived lack of function that contributes to our difficulty in understanding phenomenal consciousness. While there is clearly the need for awareness of environment regardless of phenomenal manifestation, it is less clear what role phenomenal consciousness might have without the functional awareness of objects.

the face of the perceived intractability of Chalmers's hard problem of mind. And such conceptualization does offer demonstrable empirical benefit. For while any first-person claim to awareness is still susceptible to many of the theoretically-defined pitfalls of first-person reports described earlier, claims to awareness of X preclude the need for rich qualitative description of what is experienced. The mere simplicity of the report – for example “gorilla,” “blue,” “five” - thus helps to mitigate the vagaries associated with the descriptive detail of phenomenal character. In a substantial sense, the use of the functional definition has allowed researchers to focus on conscious recognition over the actual qualitative character of experience. And in being an “experience as,” recognition parses away any of the phenomenal detail not needed for that experience.

In providing a cognitive account of consciousness, GWT can be seen as an odd sort of dual-cognition theory. Like other accounts of dual-cognition, GWT specifies the functional relation between two types of cognition, where typically conscious Type 2 cognition is uniquely characterized by the utilization of a working memory repository, the global neuronal workspace. In being a theory of consciousness, however, GWT differs from traditional dual-cognition theories in two significant ways. First, it eschews the competitive and interventionist accounts in favor of a symbiotic relation between unconscious and conscious processes. And second, the theory postulates the necessary involvement of Type 1 processes in the creation of consciousness itself. Type 1 processes may indeed form an autonomous mind, as Evans, Stanovich and others propose, but according to GWT, the conscious mind is not itself a standalone functional entity, one that simply competes with or dominates its generally unconscious counterpart.

Instead, the manifestation of consciousness relies fundamentally on the very processes that dual cognition broadly distinguishes from consciousness.⁴⁹

In its most basic form, global workspace theory defines mind as a hybrid of parallel and serial processing designed to collapse the ongoing stream of disparate brain input into a temporal sequence of semantically articulable states of affairs (Baars & Franklin, 2007; Dehaene, 2014; Shanahan & Baars, 2005) – a process that Dennett (2005) has colorfully described as “fame in the brain.” A vast array of task-specific neural modules implements Type 1 processes that continually manipulate information from both the environment and the organism (including the brain itself). The output of these modules is sent up a hierarchical chain of Type 1 processors (Damasio, 2012; Meyer & Damasio, 2009), eventually reaching the global neuronal workspace, an anatomical nexus of neural pathways that serves as the locus or “workspace” of conscious processing. While afferent pathways provide entry to this top-level convergence point for Type 1 data, efferent pathways direct workspace output back to those modules, providing a mechanism for post-convergence distribution of data.⁵⁰ Given the limited capacity of the

⁴⁹ Here, it is important to reiterate that dual cognition does not slice along the line of consciousness. As I already mentioned, in opting for a Type1/Type2 distinction, dual cognition theory does allow that conscious processes utilize Type 1 processes, making it consistent with the core tenets of GWT. That said, what is perhaps unique about GWT is its claim that consciousness requires the operation of the *same* Type 1 processes that operate in the same manner regardless of the presence of functional consciousness.

⁵⁰ It is worth noting the intersection of global workspace theory with research in other areas of brain inquiry. Hierarchical Type 1 processing and the post-workspace dissemination of information was originally proposed by Damasio (Self comes to mind: Constructing the conscious brain, 2012; Meyer & Damasio, 2009), who articulated a cognitive architecture founded on “convergence-divergence” zones, a series of processing “way-stations” on paths both to and from a top-level neural nexus. While Damasio’s architecture was not explicitly presented as a theory of consciousness, it clearly forms a necessary

global neuronal workspace, though, only a subset of the data transmitted on these afferent pathways makes it into the workspace. Entry entails a competitive process where the neural arrays supporting the workspace act as gatekeepers. These arrays evaluate the mass of arriving data to synthesize a “best fit” interpretation of the state of the organism and its environment relevant to organism’s well-being. Each bit of information on its own provides a limited such account, and it is the job of the global workspace process as a whole to construct from this diversity a differentiated yet integrated interpretation of the state of affairs. To this end, workspace processes deny entry to information that is judged inconsistent with a best-fit synthesis of the data or is otherwise deemed irrelevant to organismic well-being.⁵¹

The data that makes it into the global workspace is then broadcast back to Type 1 modules via the efferent channels of the workspace. This broadcast serves two distinct functions. It first acts to recruit additional Type 1 modules to “join in handling novel and high-priority input, and in solving current problems” (Baars & Franklin, 2007, p. 958). And second, it provides feedback to the very modules supplying data to the global workspace, enabling a self-corrective process similar to the one described in phenomenological terms by Dreyfus. So in the case where one or more Type 1 modules

component of the GWT account. Such intersection and mutual support of neural theory exemplifies Weinstein’s characterization of neuroscience as a discipline exhibiting the characteristics of paradigmatically successful scientific enterprises.

⁵¹ It bears mentioning that there are substantial epistemic and ontological ramifications to postulating an ultimate goal of organismic well-being. Specifically, that the GNW filters Type 1 output based, in part, on relevance to well-being suggests that epistemic and ontological claims are abstractions from experience, a claim long argued by phenomenologists.

responsible for detecting skunks, for example, has fired concurrent with modules devoted to detecting raccoons, a global judgment of “skunk” would reinforce the existing neural structure of the former while initiating a reworking of the latter.⁵² Here, individual Type 1 modules engage a process of learning based on a form of neuronal crowdsourcing, where a module’s information processing is a result not just of its isolated neural capacity, but of the higher-order judgments resulting from the aggregated output of task-specific experts.

The feedback broadcast from the global workspace itself stimulates additional Type 1 processing from both the original and newly recruited Type 1 modules. This begins a second iteration of communication with the global workspace, amplifying and further modulating the initial broadcast. The cycle repeats for some period of time before breaking down, creating what Dehaene describes as a transient, but stable “brain web of synchronized areas” (Dehaene, 2014, p. 140). Most importantly, it is this web of activation that consistently correlates with reports of awareness in empirical tests. Indeed, the entire natural history of such activation is clearly evident on fMRI scans, providing a triangulation of evidence between anatomical structure, first-person report, and dynamic visualization that points to one conclusion – that “consciousness lives in the loops” (Dehaene, 2014, p. 156), in the reverberation of neuronal transmission initiated by

⁵² Again, one should take this example for illustrative purposes only. Whether there exist specific Type 1 modules that detect skunks and raccoons, or whether the granularity of distinction is greater or less than I have specified, is, in this context, beside the point. What is important is that there exists some level of Type 1 processing that is modified by the judgments resulting from the aggregation of Type 1 output in the global workspace.

the broadcast of global workspace contents.⁵³ As such, the content of functional consciousness consists of whatever information has been granted access to the global workspace.

Like dual cognition theories in general, the cognitive architecture described by global workspace theory explains the “givenness” at the core of critical recognition. That is, by postulating pre-reflective, inaccessible and sub-personal processes that feed content to functionally conscious cognition, GWT provides a mechanism for understanding how, much like perception generally, the experience of critical recognition can manifest without a preceding act of conscious second-order critical evaluation. Furthermore, GWT’s focus on functional consciousness expands on the dual-cognition support for the distinction between perceived questionability as a pre-reflective phenomenon and its reflective manifestation in critical recognition. On the GWT account, critical recognition occurs because the determinations of Type 1 critical experts are deemed important enough for organismic well-being to warrant global broadcast. And in the absence of such broadcast, any phenomenal manifestation of Type 1 critical output occurs without garnering conscious attention. That is, it manifests pre-reflectively.

But GWT’s explanatory support for perceived questionability extends beyond that offered by traditional dual cognition theory. For in its account of the bidirectional and symbiotic interaction between conscious and unconscious processes, GWT makes two

⁵³ The idea that consciousness is a product of neural reverberation was first introduced by Gerald Edelman, who articulated the concept of re-entrance in the 1990s. See Searle (*The mystery of consciousness*, 1997) and Edelman (*Naturalizing consciousness: A theoretical framework*, 2003) for more information.

key points related to perceived questionability and expertise theory that are not a part of the interventionist, competitive, or reflective models. First, it proposes that unconscious processing is “always on,” that the mass of Type 1 parallel processors is constantly attending to the low-level information supplied to the brain by the organism and its environment. GWT thus endorses the possibility of a set of neurally-implemented, “always-on” critical watchdogs undergirding the pre-reflective and reflective manifestations of perceived questionability. For as I stated earlier, GWT has been proposed as a *general* architecture for cognition, one intended to subsume the variety of cognitive processes contributing to conscious awareness. How those task-specific critical “experts” go about their work and how critically granular their tasks, are further issues. But given the integral relation between thinking and questioning - between cognition and criticality - it seems ultimately reasonable to think that the account offered by GWT extends to perceived questionability. Such speculation is perhaps further justified given the dearth of empirical literature on the material basis of critical questioning.

Second, in proposing that the broadcast of global workspace content feeds back a best-fit interpretation of information relevant to organismic well-being, global workspace theory accounts for a good portion of the neural mechanics of expertise development. In so far as expertise theory proposes that phenomenologically salient feelings about one’s actions influences future perception of situational response options, GWT offers the

large-scale material account of such effect.⁵⁴ And it does this by articulating the causal story behind Dreyfus' claim that conscious feelings act to modulate – to either reinforce or weaken - situation/response pairings.⁵⁵ Specifically, GWT suggests that conscious feelings of response assessment offer the feedback needed by neural arrays to rework or reinforce their existing synaptic structure to better align with such assessments.⁵⁶ These changes then manifest as changes to functional consciousness, as low-level modules alter their processing of environmental or organismic information while the high-level gatekeepers of the global workspace develop the ability for more discriminating interpretations of the aggregate data. In its broad articulation, global workspace theory thus provides a neural account of how action and real time decision assessment transform future awareness. Indeed, it seems clear that such an account describes the material mechanism behind embodied judgment.

In proposing a hybrid parallel-serial cognitive architecture, GWT also offers a computational solution to the frame problem, one that, perhaps paradoxically, affirms Dreyfus' claim that determinations of relevance must reside at the very foundation of our

⁵⁴ That said, unlike expertise theory, GWT fails to distinguish between affective and analytical response assessment, implying that the two should bear a similar effect on functional consciousness. Indeed, GWT does not offer a neural account of the transition from Dreyfusian competence to proficiency, though it certainly does not preclude such a transition.

⁵⁵ Here, it is important to note that GWT requires such feelings to be *functionally* conscious, not merely phenomenally conscious. While Dreyfus does not explicitly distinguish between functional and phenomenal consciousness, his emphasis on the role of care in expertise development would seem to suggest the importance of reflectively attending to affective response assessment.

⁵⁶ The process of synaptic reweighting as a means of modulating the neural synchronization has long been acknowledged as a central process of brain development (see Hebb, 1949).

epistemic process.⁵⁷ As I explained earlier, the issues articulated by the frame problem are twofold. First, in the absence of any built-in criteria for determinations of epistemic relevance, we are faced with the practical issue of timeliness, where successful navigation of the world would seem to demand that evaluation of relevance be restricted to some manageable subset of epistemic commitments. And second, the fact that we do successfully navigate such situations without exhaustive evaluation appears to be inexplicable by reference to computational, rule-based theories of cognition, as any attempt to employ rules in the process of relevance determination begs for further “higher-level” rules to select which lower-level ones ought to be employed.

Global workspace theory addresses both problems by exposing two latent assumptions of the frame problem – first, that determinations of relevance must occur serially, and second, that such determinations are the responsibility of the same cognitive process that utilizes them. In critiquing the first assumption, Shanahan and Baars take issue with the design Dennett’s robot:

Perhaps Fodor and other like-minded cognitive scientists have been led astray by Dennett’s caricature of a ploddingly stupid robot trying not to get blown up. Recall that Dennett’s imaginary robot explicitly considers each irrelevant implication of its actions before it decides to ignore it. The robot’s supposed difficulty is that it doesn’t know how to stop thinking. But the design of Dennett’s robot is absurd. It carries out a serial computation that exhaustively works through a long list of alternatives one-by-one before it terminates. (Shanahan & Baars, 2005, p. 164)

⁵⁷ To be clear, to say that assignment of relevance must be a foundational component of our epistemic process is to say that our knowledge of the world already presupposes some epistemic prioritization – some filtering - of environment information. That is, we do not prioritize our knowledge claims only after obtaining that knowledge. We do so *in order to* obtain knowledge.

Here, it is not just the sheer volume of required epistemic evaluations that renders timeliness problematic. It is also the serial execution of the evaluative process, where determinations of relevance must be made sequentially. As Shanahan and Baars suggest, the fact that Dennett's robot is incapable of timely action ought to be taken as a *reductio ad absurdum* of any serial cognitive architecture.

With regard to the second assumption, Shanahan and Baars argue that in asking how a cognitive process selects the relevant information, the frame problem poses a loaded question:

...how does a cognitive process like analogical reasoning manage to select among all the information available to it? ...as it stands this question is somewhat ill-posed. It betrays an assumption that it is the responsibility of the cognitive process itself to make the selection of relevant information. According to the proposal of the present section, a better question would be the following. How is it that the required relevant information is made available to a cognitive process like analogical reasoning? (Shanahan & Baars, 2005, p. 164)

Here, the authors suggest that the "framing" of the frame problem is itself problematic in that it assumes that the cognitive process tasked with rendering decisions is the same process that is responsible for determining relevance. But as we have seen, global workspace theory avoids this assumption by specifying distinct roles for parallel and serial cognitive processes. The former generates relevance claims, while the latter utilizes them.

Thus, the global workspace architecture is well-suited to respond to the frame problem, avoiding the very assumptions that give it life. But how, precisely, does rejection of these assumptions enable GWT to resolve the issues of timeliness and

computability? The answer to the former rests with parallel processing. The parallel execution of Type 1 processes enables the simultaneous determination of relevance on a grand scale, where potentially many millions of “always-on” neural watchdogs, each tuned to respond to the presence of specific information, constantly monitor the organism and its environment. This may seem like quite a biological feat, but as Shanahan and Baars note, “with 100 billion neurons and many trillions of synapses, the human brain has plenty of scope for truly massive parallelism” (Shanahan & Baars, 2005, p. 168) . As such, there is no need for the sequential evaluation of relevance claims. Evaluation happens concurrently, rendering timeliness a non-issue.

To resolve the computability dilemma, global workspace theory engages in what may seem like sleight of hand – it actually accepts the frame problem’s conclusion that determination of relevance is not a computational, rule-based operation. However, in rejecting the “single process” assumption, GWT still offers a computational account of cognition. For it postulates that computation is at the heart of the *other* processes, the processes that manage the global workspace. While rules may be absent in the production of relevance claims, they are central to their subsequent processing, a processing devoted to the production of functional consciousness. Put simply, the selection regress is an issue only for the computational production of relevance claims. By isolating relevance determination from the production of functional consciousness, global workspace theory avoids the regress while maintaining the computational character of cognition.

It is important to be clear that, in offering this solution to the frame problem, global workspace theory affirms Dreyfus's core claim that relevance is a prerequisite for the creation of mental representation. The GWT account specifies relevance determination as a prerequisite for the production of semantically articulable mental tokens, postulating, like Dreyfus, that awareness of any concrete state of affairs is founded upon the relevance claims of the organism. Furthermore, given that both expertise theory and GWT peg the development of relevance-generating structures to organismic goals, they stand in contrast to traditional computational theories of mind, which conceive of cognition as the rule-based manipulation of representational tokens (see Fodor, 1983). In such a model, neither relevance nor goals factor into the creation of representations. Rather, they are cognitively integrated only afterward, as part of their computational manipulation. Indeed, this chronology of the cognitive process is at the heart of the frame regress. As such, it is little wonder that GWT aligns with Dreyfus's anti-representationalist stance. It would seem that any solution providing an "out" from the regress would be forced to affirm the temporal primacy of relevance.⁵⁸ Yet, it should also be clear that neither expertise theory nor GWT precludes the use of goals and relevance determinations in the subsequent manipulation of representations, particularly

⁵⁸ To be fair, others have preceded Dreyfus in making similar claims. From a philosophical perspective, Heidegger (*Being and time*, 1962) argued that what we take to exist – our perceived ontology – is a function of care, the fundamental source of our goals, projects, and actions. Merleau-Ponty (*Phenomenology of perception*, 2013) suggested that the particular structure and functioning of our body – its limits, capabilities, needs, and goals – influence our experience of the phenomenal world. And in the empirical domain, Gibson's notion of affordances (Greeno, 1994; Scarantino, 2002) and Walter Freeman's attractor states (Freeman, 2000) provide scientific analogs of the same basic idea – that our perceived ontology is a product of our goal-oriented navigation of the world.

at the level of conscious cognition. Rather, the important takeaway is that both theories conceive of such thinking as involving mental tokens that are themselves the product of the goals and self-assessments of an organism seeking to thrive in the world.

6.6. Reprise: Criticality as a form of judgment and the paradox of criticality

At this point, we can articulate how global workspace theory supports the two claims that underwrite criticality as a form of judgment. Of course, such a position assumes that the process of critical recognition can be subsumed by the cognitive architecture articulated by global workspace theory. But if it can – and I have argued as much – global workspace theory offers material justification for this conception. Indeed, I have already noted that in hypothesizing the neural reworking of relevance determination as a consequence of consciousness, GWT postulates the very mechanism of embodied judgment. The process of relevance determination may not itself qualify as an *act* of judgment traditionally conceived, but the fact that the conditionals of previous critical assessment cause Type 1 relevance generators to output assertions that abide by those conditionals suggests that such a process is still a *form* of judgment – one that is embodied in a semantically inarticulate and non-representational neural configuration.

Let me suggest, however, that global workspace theory justifies the second, and perhaps more contentious, claim that the production of functional consciousness is itself a process of ongoing judgment. For in creating a definitive state of affairs from the mass of statistical relevance claims, the processes of the global workspace must engage in an evaluation of competing claims. They must decide, according to criteria such as internal consistency, which claims warrant inclusion in a best-fit synthesis of the data in any

particular situation. And given the semantic character of these claims, such decision-making seems paradigmatically judgmental in that it entails the explicit weighing of alternatives. Indeed, Dehaene reports that, in the process of settling on a defined state of affairs, the neural structures of the global workspace consider several hypotheses at once (Dehaene, 2014, p. 99). If this is the case, global workspace processing not only evaluates which relevance claims deserve inclusion, but it does so by weighing a number of possible claim combinations. The construction of functional consciousness would thus seem to be a neural exemplar of judgment as traditionally understood – a process that evaluates a set of claims founded on past experience to decide what we ought to attend to in the present. Critical recognition, as the act of becoming functionally conscious of what we ought to *interrogate* in the present, is likely the result of this same sort of judgment process.

To be clear, the creation of functional consciousness is an ongoing act of judgment because the global workspace process must adjudicate among an ever-changing set of relevance claims. As I have presented it, the embodied judgment of Type 1 generation cannot itself be considered an act of judgment because of its non-representational, non-semantic character. But the only viable interpretation of a process that creates a single target of reflective attention from a seemingly infinite number of possible relevance claim permutations is as an act of judgment. And this is the neural reason for the weakness of the sensitivity conception – it fails to account for the big picture. That is, in the presence of a mass of competing and potential conflicting relevance claims, sensitivity to any specific critical environmental cue does not itself

warrant a critical response. Some additional process must sanction relevance in light of other factors. The beauty of a parallel processing model is that, at a fundamental level, our brain can present for its own consideration a complex picture of the world that includes potentially disparate and unrelated aspects. And yet, if functional consciousness is serial, if we must consciously attend to only one aspect of that picture at any particular moment, we must have a tool to judge which aspect deserves that consideration.

In describing perceived questionability as a pervasive structural component of experience that episodically manifests in critical recognition, I have presented the phenomenology of criticality in a manner that aligns particularly well with GWT. For GWT does not preclude the phenomenal manifestation of Type 1 output.⁵⁹ It simply insists that we cannot be reflectively aware of it. This is precisely the distinction between perceived questionability and critical recognition that the phenomenology seems to suggest. As part of the structural background of experience, perceived questionability tends to manifest pre-reflectively, inarticulately, and minimally – much like the way we perceive the leaves of a forest from a distance, or see our shadow on the sidewalk as we attend to oncoming street traffic. Critical recognition, however, like all recognition, punctuates reflective experience, creating a discreet object of conscious attention in moments where felt epistemic acceptance or resistance demands attention. It is precisely this demand that is the act of judgment, a judgment that proclaims “this is important,

⁵⁹ As noted earlier, dual cognition theory specifically proposes that some Type 1 processes manifest phenomenologically, particularly affectively.

think about it.” Such is the purpose of functional consciousness, of Dennett’s “brain fame” – to issue these judgments, so that we may attend to that which is judged to be important to our ongoing well-being.⁶⁰

One final point is in order. At the end of chapter 3, I proposed a resolution to what I had earlier called the paradox of criticality. I suggested that the theoretically infinite regress of criticality meets its practical end in the act of critical recognition, that in approximating a standard of criticality, we can stop questioning without compromising the critical character of critical interrogation because we appropriately recognize that further questioning is not relevant. The question then becomes how recognition can serve this role, how its determinations of critical relevance or irrelevance can be justified to the point that ending the critical regress does not automatically render critical behavior “uncritical.” When the issue is framed this way, it should be clear that the paradox of criticality is closely related to the frame problem. For in suggesting that a vicious regress results from any attempt to specify criteria for determining relevance, the frame problem, like the paradox, asks how it is possible to non-arbitrarily stop thinking when faced with the need to make a decision in an informationally unencapsulated context. The fact that global workspace theory proposes that thinking starts and ends with the production of

⁶⁰ Two points here. First, I might note that while the literature considers well-being to be defined biologically, such a definition does not preclude attention to aesthetic, ethical, and other abstract considerations. Clearly, our well-being is, to varying degrees, affected by such considerations. Second, the social construction of a critical ideal amounts to a social claim about the role of critical interrogation in promoting well-being. Specifically, such a claim suggests that to the degree we approximate the ideal, we also promote our well-being.

Type 1 relevance claims thus suggests that we might look to Type 1 processors for a material resolution to the criticality paradox as well.

And this is, indeed, where I believe such resolution lies – in the embodiment of critical judgment. Global workspace theory is clear that Type 1 modules have been designed to output statistical assertions consistent with our conscious assessments of past relevance claims. That is, situationally-specific relevance claims previously judged to have facilitated successful behavior are likely to be reinforced, while claims judged to have had the opposite effect are apt to be abandoned. Thus, to the degree that such claims express a response to past experience, they are not epistemically arbitrary. And given their foundational role in critical recognition, both the recognition *and non-recognition* of critical opportunities are themselves similarly justified.

It is particularly important that we appreciate this criticality of non-recognition. For it means that in ceasing the critical process, in putting an end to the theoretically endless iterations of critical questioning, we do not engage in an arbitrary, acritical act. Rather, the lack of critical recognition - at least to the degree that it expresses a critical standard – is an act pregnant with the critical judgment of past experience. As we have seen, the Type 1 relevance generators of global workspace theory are “always-on,” constantly monitoring the organism and its environment for information relevant to organismic well-being. When those modules responsible for determining critical relevance have been “tuned” to a critical standard, their lack of response is as much a justified statement of critical relevance as any response. Thus, the end of the critical

regress is only ostensibly acritical and arbitrary. In actuality, both critical recognition and lack of critical recognition are critical through and through.⁶¹

6.7. Limits and promise

As I mentioned earlier, the relative nascence of cognitive neuroscience suggests that we ought not to expect any single existing neurocognitive theory to provide a comprehensive material account of the expertise conception. Such is certainly the case with global workspace theory. While a large and growing set of empirical data points to GWT as a theory with staying power (see Dehaene, 2014), it is far from the comprehensive account of cognition needed to address the diverse aspects of critical expertise. Perhaps its most salient deficiency in this regard concerns the role of affect. Here there are two issues – first, the affective character of perceived questionability, and second, the lack of distinction between affective and analytical response assessment. This latter issue, in particular, prevents GWT from offering an account of the phenomenological transition from competence to proficiency, leaving us with only the general claim that all conscious awareness, affective or analytical, bears influence on the relevance claims produced by Type 1 modules. What is likely needed to fill this gap is a contribution from theories that articulate the role of affect in cognition, of which there is a burgeoning literature (see, among others, Damasio, 2012; Panksepp, 2014; Rolls, 2013; Thagard & Aubie, 2008; Bechara, 2004).

⁶¹ Here, I need to reiterate that I am speaking only of the case when critical behavior approximates the critical ideal. Of course, lack of critical recognition in particular, can simply be symptomatic of a lack of criticality, a fact that may render the assessment of critical behavior difficult. But the essential point here is that the paradox of criticality does not a priori doom the very concept of criticality.

That said, we ought to acknowledge what global workspace theory does offer - an empirically substantiated, material account of cognition that aligns remarkably well with the expertise conception of criticality. From its ability to explain the givenness of critical recognition, to its description of a mechanism that enables transformation of awareness through self-assessment; from its support for critical recognition as a form of judgment, to its material resolution of the criticality paradox, GWT provides an empirically viable material basis for the view of criticality that I have articulated in previous chapters. In this sense, it satisfies one side of the symbiotic relation between first- and third- person accounts of mind. Indeed, in portraying perceived questionability, expertise theory, and global workspace theory as necessary partners in an account of criticality, I have attempted to elaborate both sides of this relation, offering an example of how phenomenological analysis and cognitive neuroscience can work together to make headway on a longstanding issue central to, and defined by, education. Such an example, I suggest, serves to highlight the promise of educational neuroscience.

Chapter 7: Educating for Criticality

7.1. Introduction

Unlike sensitivity and motivation, the expertise conception articulates an understanding of criticality that does justice to our deepest sense of critical behavior. It is not simply that expertise accounts for the critical ideal of appropriate questioning. Rather, in providing an out from the paradox of criticality, the expertise conception does something else that the other conceptions fail to do – it preserves the viability of the criticality in light of its epistemically iterative nature. Stated with regard to the pragmatics of criticality, the expertise conception is unique in showing how the end of critical interrogation can itself be a critical act. Motivation and sensitivity may explain the impetus for critical engagement, but in failing to offer an account of critical non-recognition, both conceptions fail to impute critical character to its ostensibly acritical end. The expertise conception addresses this shortcoming through the idea of embodied judgment, thus legitimizing the strong sense of criticality that is central to our normative educational vision.

Ultimately, though, the expertise conception ought to prove its value in the classroom. Indeed, any conception of criticality, regardless of how well justified, proves valuable only to the degree that it facilitates the approximation of an accepted critical standard. To this end, much has been written about the educational ramifications of motivation and sensitivity as they relate to critical thinking disposition. And to no surprise, much of this literature amounts to articulating ways to motivate students to critically engage and make them more sensitive to critical opportunities (see, for

example, Costa & Garmston, 2001; Tishman, 2001; Richhart, 2001; Facione, 1990). In a similar manner, I might offer the generalization that criticality as judgment suggests that an education for criticality ought to focus on improving the critical judgment of students. This claim seems obviously true – indeed, almost trivial - given the expertise conception that I have articulated. And yet, a look at the theories that justify such a conception – expertise theory and GWT – suggest changes to classroom practice that do seem to hold the promise of moving students toward the critical ideal of appropriate questioning.

Again, we ought to keep in mind a point I made earlier regarding the findings of neuroscience. Contrary to Willingham's assumption that neuroscience must introduce novel pedagogical ideas to justify its educational relevance, I have argued that the discipline can serve a valuable supportive, creative, and critical role even in the absence of breakthrough contributions. That is, it can provide both the warrant for pedagogical decisions and the inspiration for research in other educationally-relevant domains. With this in mind, the concrete changes to teaching and learning suggested by an expertise conception of criticality are not themselves novel or ground shaking. But in being based on phenomenological analysis and neurocognitive theory, they perhaps include novel and substantive reasons why we ought to implement them. And they certainly provide insight into the contributions and shortcomings of educating for critical motivation and sensitivity alone. As such, I would again offer the expertise conception, and its neuroscientific warrant, as an exemplar of how we might partner first and third-person theory of mind to address educational issues.

7.2. Education and the modulation of functional consciousness

Perhaps the most educationally-relevant feature of both expertise theory and GWT concerns the self-modulation of functional consciousness. As discussed in the previous two chapters, both theories postulate a feedback loop where consciousness serves to recalibrate its own future tendency toward certain experiences of awareness. In the language of expertise theory, this recalibration is described as the strengthening or weakening of particular perceptual responses to the world. For GWT, recalibration entails the rewiring of neural arrays devoted to relevance determination and the global workspace gatekeepers. In both cases, experience is not described as a static, passive rendering of the environment, but as a malleable response substantially influenced by our goals, activities, and even the capabilities and constraints of our bodies.¹ This is not to discount the role of the environment in experience, but to acknowledge its complex relation to the subject in the production functional consciousness.

Both theories thus imply two levers to modulate conscious awareness – that which exists in the world, and our personal investment in it. These, in turn, suggest two concrete and significant pedagogical changes required for an education for criticality. First, to the degree that movement toward the critical ideal contingently entails more critical engagement, educators simply ought to create a world with more critical engagement, one where critical interrogation is part and parcel of daily life. Clearly, in

¹ For more on the role of the body in perception, see Scarantino, 2002, Greeno, 1994, Gallagher, 2005, and Merleau-Ponty, 2013.

the domain of schooling, this starts with substantive changes to the pedagogy of the curriculum. Rather than teach for answers and fact, we ought to engage a concerted effort to portray the disciplines as ongoing sites of critical inquiry, both with regard to unanswered questions and matters of established theory. Indeed, a “pedagogy of answers,” where teaching consists solely, or even primarily, of introducing students to the accomplishments, methods, and current state of a discipline, works against an education for critical engagement. For it is not just that this sort of teaching neglects to appropriately develop the Type 1 neural arrays needed to generate critical relevance. It creates the general mindset that the discipline is authoritative - that its output is generally definitive and without a need for ongoing epistemic critique of its content. While we may not at this point understand the neural ramifications of such a mindset, we have good reason to believe that it works contrary to the goal of criticality. It is also particularly unfortunate given that the actual practice of the disciplines is characterized by a continual communal critique of theory and method.

That said, substantive changes to the pedagogy of the disciplines is not itself sufficient to create a more “questioned” world. Here it is important to remember that the educational aim concerns not domain-specific criticality, but everyday criticality. As such, we are faced with two options – encourage the transfer of domain-specific criticality to the diverse and complex contexts of everyday life, or present a more questioned everyday world. While there is an extensive literature on the pedagogy of transfer, the possibility and extent of successful transfer with regard to critical disposition remains an open issue (see, for example, Willingham, 2007; Perkins & Salomon, 2012;

McPeck, 1990). Regardless of the viability of transfer within the disciplines themselves, one would think that transfer of criticality from the disciplines to the context of everydayness would be that much more difficult. Indeed, in limiting the education for criticality to the disciplines, we run the risk of conveying the message to students that critical engagement is solely a mode of academic behavior. This is especially true in the presence of contemporary non-academic social and cultural pressures toward epistemic conformity and homogeneity, where I would venture to say that media, government, business and various other social institutions work in concert to present a unified, comprehensive, and dominant worldview. In this sense, the education for criticality is always fighting an uphill battle, working to enact change in the context of powerful oppositional forces.

It would thus seem reasonable to suggest that education for criticality requires schools to make critical interrogation a part of their everyday functioning. This begs for an enculturation of criticality (Richhart, 2001; Tishman, Jay, & Perkins, 1993), where critical engagement is a matter of course not only in the disciplines, but on the playground and ball field, in the cafeteria and at assembly, and during any other of the myriad routine activities of school life. This is clearly no small task, and involves not merely the modelling of critical engagement by teachers in formal didactic situations, but their actual critical engagement in daily tasks – in their interaction with other teachers and staff, as well as their non-academic interaction with parents and students. Ideally, such engagement would extend to non-teaching personnel as well, permeating the nooks and crannies of social life at school so that criticality is perceived casually by students, as

part of the baseline of both their academic and non-academic experience.² No doubt, such a vision of the school borders on the utopic, especially again, in light of the larger social and cultural forces at play. But the theories supporting the expertise conception of criticality suggest that critical perception requires the presence of critical opportunities in the environment. Given that every assertion and state of affairs could be considered a critical opportunity – as I argued in Chapter Three – existence reduces to salience. That is, critical opportunities exist as something distinguishable from the background questionability of everything only when they are made visible *as* an opportunity. To the degree that such opportunities are excluded from the everydayness of the school environment and limited to academic interaction, we thus fail to make them salient in the everyday world. At that point, we rely solely on the potential of transfer to make academic criticality a cornerstone of an education for everyday criticality.

But as suggested by both expertise theory and global workspace theory, there is more to the modulation of functional consciousness than the structure and content of the environment. Both theories acknowledge the influence of our personal investment in it –

² Here, I ought to note the gap between everyday life and everyday life *at school*. In arguing that education for criticality requires a culture of criticality at school, I am still assuming that some sort of transfer is necessary. That said, this would seem to be the minimal level of transfer assumed to take place in educating for anything.

On the other hand, this gap highlights again the limitations of schooling with regard to an education for criticality. A student's everyday life in school is only a fraction of a student's everyday life, and it is clear that the broader environment of the individual – the environment outside of school – fails to make salient the critical opportunities needed to promote approximation of the type of critical standard articulated by education (even accounting for regional variance). Thus, we might ask about the possible effectiveness of an education for criticality in a world where the critical standard diverges from the educational ideal. If people “live their world,” as global workspace theory in particular would seem to suggest, we ought to expect the critical ideal of everyday life to work at cross-purposes to the educational ideal.

what Dreyfus calls “care,” and what GWT terms “relevance.” As such, care plays a central role in criticality, helping to determine which assertions and situations we take to be critical opportunities. This is a position held by the motivation conception as well, which assumes that motivation to engage critically follows from caring about criticality. Indeed, the Delphi commission made the development of care for critical thinking a centerpiece of its pedagogical recommendations, suggesting that teachers find ways to impress upon students the personal and social benefits of thinking critically (Facione, 1990). I explored this relation between rational valuation and critical behavior back in Chapter 3, and I won’t revisit the details now except to again note the gap that exists between the two. As I discussed then, the concept of sensitivity was proposed precisely to fill this gap.

That said, I would suggest that the specific role of care in the expertise conception is not the same role defined by the motivation conception. Where the motivation conception specifies a link between care and the in-the-moment tendency to critically interrogate - as if care underwrites an affective and “consistent internal motivation” to act critically (Facione, 2000, p. 61) - the expertise conception views care as a before-the-moment influence, a necessary factor in the development of critical recognition skill.³ Indeed, this is the takeaway from both expertise theory and global workspace theory. In

³ Note that in calling critical recognition a skill, I am committing to a skill-based view of critical disposition. Such a view is a direct rejection of perhaps the core distinction of critical thinking theory – the distinction between critical thinking skills and the disposition to use them. While I certainly do not wish to engage the issue in detail at this point, it seems clear to me that the expertise conception of criticality, and specifically its backing in GWT, provide ample reason to question the viability of a rigid boundary between skills and dispositions.

the case of expertise, care is necessary make the jump from the conscious and conceptual judgment of situation characteristic of Dreyfusian competence to the intuitive, perceptual judgment of proficiency. And in the case of GWT, care influences the development of neural processes that generate relevance claims and adjudicate among them.

This difference in the function of care bears concrete ramifications for an education for criticality. While it is no doubt important that teachers impress upon students the value of appropriate critical engagement in everyday life, it is by no means sufficient for the development of critical recognition. Rather, if emotional commitment to interrogative decision-making must accompany its practice in order to move from critical competence to critical proficiency, teachers ought to expend energy creating environments where students care about their decision to iteratively interrogate. Here teachers might seek to engage critical discussion on matters of personal relevance, where the decision to accept or critically engage an assertion is not merely academic, but a matter of personal significance - where the motivation to keep questioning the basis of an issue comes from wanting to know, not from getting a grade or learning a skill. Perhaps topics related to current events, the origin of the universe, or the ontological status of mathematics, would inspire the necessary emotional commitment. But if not, teachers might have to expand the domain of legitimate school discussion to include sports, pop culture, monsters, or first-person shooter games. Indeed, if “we hold dear the ability to nurture critical disposition, we may have to embrace discussions on any number of unexpected topics” (Fisherman, 2014a, p. 102).

Alternatively, we might look not to the topic of discussion to generate commitment, but to its context. While I am fully aware of the potential downside of encouraging a competitive spirit to communal deliberation, formal activities such as debates, model UN, and ethics bowls offer students the opportunity to engage critically in an environment conducive to care (Fisherman, 2014a). I would venture to say that in-class games, even video games, could provide a similar avenue for emotionally committed critical engagement.⁴ This is not to say that such games already exist, but only that we might see gaming as a potential mode of critical practice that satisfies the need for care. Here, I might note that in any of these activities, we need to ensure that opportunities for continued questioning are not dominated by a focus on answers, problem solving, or reasoning, although these are clearly important in their own right. In my own experience supervising a high school ethics bowl team, I have been disappointed by this “dominance of answers,” where rebuttals to specific positions were framed not as openings for further inquiry, but as definitive positions on the issue at hand. While the assertive component of critical engagement cannot be ignored, we need to be alert to the ease with which answering the question or resolving the issue becomes the focus of the activity, thus rendering the care for iterative questioning subservient to the care for answering. As I have argued throughout this work, criticality demands a persistent effort to dig deeper into our foundational beliefs, an effort that itself requires that we treat

⁴ See Gee (What video games have to teach us about learning and literacy, 2003) for an extended and convincing argument touting the educational, and indeed critical, virtues of video games.

answers as invitations to interrogation. Without the requisite focus on questioning, though, we ought not to expect to dig very deep.

7.3. Philosophy and an education for criticality

This is where philosophy itself proves valuable as a didactic discipline.

Numerous proponents of critical thinking education have advocated for incorporating philosophy in the curriculum, with Carrie Winstanley offering, for example, that “critical thinking is the essence of philosophy” (Winstanley, 2009, p. 91) , and Matthew Lipman arguing that “only philosophy can provide the logical and epistemological criteria that are now lacking in the curriculum” (Lipman, 2003). However relevant such reasons are to the specific development of criticality, I would like to introduce two additional reasons, reasons that derive from the levers of care and environment. First, to the degree that approximating the critical ideal contingently requires that individuals be more apt to interrogate assertion, doing philosophy has the perhaps unique potential for inspiring care for questioning over care for answers. I would suggest that such potential derives, ironically, from the greatest failure of philosophy as a discipline of inquiry – its inability to lay to rest debate over its central questions, to provide definitive answers. Philosophy is truly unique in this regard, and has engendered much criticism for it, both from within the field and without. Indeed, Wittgenstein devoted much of his later life attempting to

expose philosophy as a confused, sense-less, and ultimately useless discipline of inquiry whose only redeeming goal could be to provide its own reasons for closing shop.⁵

And yet, this failure of philosophy is precisely the reason why the discipline has didactic value.⁶ For clearly, that the questions of philosophy still engender serious study despite their long-standing intractability suggests that they maintain a substantial and broad allure. And I would argue that such allure is not simply conceptual and intellectual, but affective – that the questions themselves inspire an emotional response that elicits engagement despite their intractability. Indeed, I have seen this sort of response as a matter of course when introducing core philosophical questions to both high school students and undergraduates. For the large majority of my students, the problematizing of their world, their recognition that the assumed “facts” of the world are at all question-able, is to varying degrees revelatory. Certainly, the opening up of the possibility of a re-envisioned world generates both confusion and angst. Yet it simultaneously lends a measure of palpable and ongoing excitement, an excitement not for actually re-envisioning the world, but for the very possibility of re-envisioning – for the fact that there is “more to it” than previously thought. Often, this excitement is explicit, with students paradoxically describing their exhilaration upon leaving class with, for example, the eerie feeling that perhaps there is no way that the world “looks”

⁵ This goal is perhaps best expressed when Wittgenstein states “What is your aim in philosophy? —To shew the fly the way out of the fly-bottle” (Wittgenstein, 2001, p. 87e).

⁶ Indeed, I have offered a similar argument in Fisherman 2014b(Fisherman D. , Wittgenstein and the value of meaningless questioning, 2014b).

independent of mind. Other times, the excitement manifests more subtly, in increased class engagement, or simply in an engaged, attentive look. And such interest is not necessarily a byproduct of the initial philosophical question, either. The emotional experience of “no longer knowing” regularly punctuates philosophical discourse.

This is not to say that questions in physics and mathematics do not inspire such a response. Rather, both the epistemic track record and established methodologies of those disciplines motivate a shift from care for the question to care for an answer. In being affectively drawn to philosophical questions, though, one’s care is never focused solely on generating answers. Rather, it is always focused beyond the answer, on elaborating the questions that arise from any given answer.⁷ Such a practice is the practice of criticality, the practice of iterative interrogation. We might thus revise Winstanley’s claim to proclaim that criticality is the essence of philosophy.

Beyond inspiring this care for the question, philosophy serves a further role in the didactic modulation of critical consciousness – it allows students to test the limits of appropriate questioning, particularly as they relate to practical decision-making. Stated differently, it enables us to put to the test the assertions that ought to comprise the epistemic foundation of everyday life. And it does this by providing a forum to delve into Burbules’s deep sense of criticality, where individuals iteratively interrogate to the depth of fundamental belief. At some point in this process, questioning the belief itself

⁷ As David Kennedy has often said, philosophical “progress” merely causes the horizon of inquiry to recede.

becomes questionable, and the response to continued questioning can no longer sensibly constitute an epistemic reason but only a rejection, one that fundamentally upends the epistemic “riverbed” (Wittgenstein, 1969) that underwrites our understanding and everyday judgment. It is at this point that we separate the beliefs which can be sensibly questioned from those which we must accept axiomatically (Wittgenstein, 1969).

Thus, we are again back to the core of the paradox of criticality, where it seems that the process of critical judgment requires the uncritical acceptance of at least one assertion. But let me suggest that the concept of criticality is not threatened by such an axiomatic bedrock. For in knowing that there is an end to justification, we salvage criticality by understanding that we can go no further without “a-justifiably” rejecting the basis for our beliefs. And we get to this understanding only when we get to the point of questioning the question. As I have argued throughout, we resolve the paradox of criticality through critical recognition, where recognition is itself an act of in-the-moment critical judgment based on the reified amalgam of our previous judgments. Such is the upshot of both expertise theory and GWT. But for recognition to be truly critical, this amalgam needs to be critical all the way down. That is, it needs to include the judgments we make when questioning the question, when we understand that we can no longer offer epistemic reasons as a response to the critical challenge and have articulated the consequences of rejecting what we had previously, and uncritically, accepted as true. This is how I interpret the charge offered by Burbules and Berk, Paul, and others to delve deep. And the only way to meet this charge is to engage in the extended iterative questioning that leads to questioning the question. This, then, is what philosophy

provides – a forum, a space, where outside of both daily life and the accepted methodologies of the disciplines, individuals can iteratively question to the point where they critically evaluate not just the responses to those questions, but the legitimacy of asking them in the first place.⁸

This is perhaps the most fitting conclusion for an extended philosophical treatment of criticality – that philosophy itself is the didactic tool of the critical ideal. In some ways, this is the same conclusion that other proponents of critical thinking have reached. Yet in other ways, the conclusion is different. Philosophy is not uniquely positioned to develop good thinking as is argued by many proponents of critical thinking. Nor is it necessarily first among the disciplines in nurturing good practical judgment, as it was to Matthew Lipman and Ann Sharp, the founders of the philosophy for children movement (Lipman, 2003; Sharp, 1991). But philosophy does have a unique place in education as the domain of truly iterative questioning, of questioning until the legitimacy of the question is itself at stake. This, I would suggest, is the strongest argument for the need to do philosophy in schools. For such questioning puts us on a path toward the critical ideal while simultaneously addressing the paradox of criticality.

⁸ I might note that Vansieleghem comes to an ostensibly similar conclusion – that didactic philosophy ought to be most valued as a space. Vansieleghem's space, however, is devoted to cognitive natality, to the creation of new thought, whereas the space I describe facilitates evaluation of critical boundaries. Clearly, there is a close connection between the two, one that mirrors the relation between critical thought and creative thought. However, I would suggest that the two maintain an integrity independent of the other. That is, one can do one without engaging the other.

References

- Abrami, P. C., Bernard, R. M., Borokhovski, E., Wade, A., Surkes, M. A., Tamim, R., & Zhang, D. (2008). Instructional interventions affecting critical thinking skills and dispositions: A stage 1 meta-analysis. *Review of Educational Research*, 78(4), 1102-1134.
- Adorno, T. (1998). Education After Auschwitz. *Critical models: Interventions and catchwords*, pp. 191-204.
- Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology*, 84(3), 261-271.
- Ansari, D., Coch, D., & De Smedt, B. (2011). Connecting education and cognitive neuroscience. *Educational Philosophy and Theory*, 43(1), 37-42.
- Arendt, H. (1978). *The life of the mind*. New York: Harcourt Brace and Company.
- Aydede, M. (2015). *The language of thought hypothesis*. Retrieved from Stanford Encyclopedia of Philosophy:
<http://plato.stanford.edu/archives/fall2015/entries/language-thought/>
- Baars, B., & Franklin, S. (2007). An architectural model of conscious and unconscious brain functions: Global Workspace Theory and IDA. *Neural Networks*, 20(9), 956-961.
- Banaji, M., Blair, I., & Glaser, J. (1997). Environments and Unconscious Processes. In J. R. Wyer, *The automaticity of everyday life: Advances in social cognition*. (pp. 63-74). Mahwah: Lawrence Erlbaum Associates.

- Bargh, J. A. (1997). The automaticity of everyday life. In R. S. Wyer Jr, *The automaticity of everyday life: Advances in social cognition* (pp. 1-61). Mahwah: Lawrence Erlbaum Associates.
- Bargh, J. A., & Ferguson, M. J. (2000). Beyond behaviorism: on the automaticity of higher mental processes. *Psychological Bulletin*, 126(6), 925-945.
- Barnett, R. (1997). *Higher education: A critical business*. Oxford: Oxford University Press.
- Bechara, A. (2004). The role of emotion in decision-making: Evidence from neurological patients with orbitofrontal damage. *Brain and Cognition*, 55(1), 30-40.
- Bechara, A., & Damasio, A. (2005). The somatic marker hypothesis: A neural theory of economic decision. *Games and Economic Behavior*, 52(2), 336-372.
- Benner, P., Tanner, C., & Chesla, C. (2009). *Expertise in nursing practice: Caring, clinical judgment, and ethics*. Springer Publishing Company.
- Berger, W. (2014). *A more beautiful question*. New York: Bloomsbury.
- Beyer, B. (2001). What philosophy offers to the teaching of thinking. In A. Costa (Ed.), *Developing Minds: A Resource Book for Teaching Thinking* (pp. 87-91). Alexandria: Association for Supervision and Curriculum Development.
- Biesta, G. (1998). Say you want a revolution... Suggestions for the impossible future of critical pedagogy. *Educational Theory*, 48(4), 499-510.
- Biesta, G. (2011). Philosophy, exposure, and children: how to resist the instrumentalisation of philosophy in education. *Journal of Philosophy of Education*, 45(2), 305-319.

- Burbules, N., & Berk, R. (1999). Critical thinking and critical pedagogy: Relations, differences, and limits. In T. Popkewitz, & L. Fendler, *Critical Theories in Education* (pp. 45-65). New York: Routledge.
- Burton, R. (2016, 09 05). *A life of meaning (reason not required)*. Retrieved from <http://www.nytimes.com/2016/09/05/opinion/a-life-of-meaning-reason-not-required.html?ribbon-ad-idx=7&rref=opinion&module=Ribbon&version=context®ion=Header&action=click&contentCollection=Opinion&pgtype=article>
- Campbell, S. (2011). Educational neuroscience: Motivations, methodology, and implications. *Educational Philosophy and Theory*, 43(1), 7-16.
- Chalmers, D. (1995). Facing up to the problem of consciousness. *Journal of consciousness studies*, 2(3), 200-219.
- Chalmers, D. (1996). *The conscious mind: In search of a fundamental theory*. Oxford: Oxford University Press.
- Chin, C. (2004). Questioning students in ways that encourage thinking. *Teaching Science: The Journal of the Australian Science Teachers Association*, 50(4).
- Common Core State Standards Initiative. (2010). *Common Core state standards for english language arts & literacy in history/social studies, Science, and technical subjects*. Washington, DC: National Governors Association Center for Best Practices & Council of Chief State School Officers.

- Costa, A. (2001). Habits of mind. In A. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (pp. 80-85). Alexandria: Association for Supervision and Curriculum Development.
- Costa, A., & Garmston, R. (2001). Five human passions: The origins of effective thinking. In A. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (pp. 18-22). Alexandria: Association for Supervision and Curriculum Development.
- Craft, B., & Ideas, D. (2010). Common core state standards for english language arts and literacy in history/social studies, science, and technical subjects. Common Core State Standards Initiative.
- Damasio, A. (2012). *Self comes to mind: Constructing the conscious brain*. New York: Random House, LLC.
- Dehaene, S. (2014). *Consciousness and the brain: Deciphering how the brain codes our thoughts*. New York: Viking Press.
- Dennett, D. (1984). Cognitive wheels: The frame problem in artificial intelligence. In C. Hookway (Ed.), *Minds, machines and evolution* (pp. 129-151). Cambridge: Cambridge University Press.
- Dennett, D. (1991). *Consciousness explained*. Boston: Back Bay Books.
- Dennett, D. (2001, March 1). *The fantasy of first-person science*. Retrieved from <https://ase.tufts.edu/cogstud/dennett/papers/chalmersdeb3dft.htm>
- Dennett, D. (2005). *Sweet dreams: Philosophical obstacles to a science of consciousness*. Cambridge, MA: MIT Press.

- Dewey, J. (1910). *How we think*. Boston: D.C. Heath & Co.
- Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Henry Holt and Company.
- Dewey, J. (2007). *Human nature and conduct: An introduction to social psychology*. New York: Cosimo.
- Donalek, J. (2004, Dec). Phenomenology as a Qualitative Research Method. *Urologic Nursing*, 24(6), 516-517.
- Dorst, K., & Reymen, I. (2004). Levels of expertise in design education. *Internal engineering and product design education conference*, 1-8.
- Dowling, M. (2007). From Husserl to van Manen. A review of different phenomenological approaches. *International Journal of Nursing Studies*, 44(1), 131-142.
- Dreyfus, H. (1988). *Mind over machine*. New York: The Free Press.
- Dreyfus, H. (2002). Intelligence Without Representation – Merleau-Ponty's critique of mental representation: The relevance of phenomenology to scientific explanation. *Phenomenology and the Cognitive Sciences*, 1(4), 367-383. Retrieved from Cognitive Sciences Center: <http://www.class.uh.edu/cogsci/dreyfus.html>
- Dreyfus, H. (2008). *On the internet*. Routledge.
- Dreyfus, H. (2012). Why heideggerian AI failed and how fixing it would require making it more heideggerian. In *Heidegger and Cognitive Science* (pp. 62-97). Palgrave Macmillan.

- Dreyfus, H. (2014). Overcoming the myth of the mental - How philosophers can profit from the phenomenology of everyday expertise. In *Skillful Coping: Essays on the Phenomenology of Everyday Perception and Action* (pp. 104-124). Oxford: Oxford University Press.
- Dunne, G. (2015). Beyond critical thinking to critical being: Criticality in higher education and life. *International Journal of Educational Research*, 71, 86-99.
- Edelman, G. M. (2003). Naturalizing consciousness: A theoretical framework. *PNAS*, 100(9), 5520-5524.
- Ennis, R. (1991). Critical thinking: a streamlined conception. *Teaching Philosophy*, 14(1), 5-24.
- Ennis, R. (1996). Critical thinking dispositions: Their nature and assessability. *Informal Logic*, 18(2 & 3), 165-182.
- Ennis, R. (2004, March 24). *A super-streamlined conception of critical thinking*. Retrieved 4 2010, from CriticalThinking.NET: <http://criticalthinking.net>
- Eshach, H., Dor-Ziderman, Y., & Yefroimsky, Y. (2014). Question asking in the science classroom: Teacher attitudes and practices. *Journal of Science Education and Technology*, 23(1), 67-81.
- Evans, J. (2006). The heuristic-analytic theory of reasoning: Extension and evaluation. *Psychonomic Bulletin & Review*, 13(3), 378-395.
- Evans, J. (2008). Dual-processing accounts, of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59, 255-278.

- Evans, J. (2011). Dual-process theories of reasoning: Contemporary issues and developmental applications. *Developmental Review*, 31(2), 86-102.
- Evans, J., & Stanovich, K. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspectives on Psychological Science*, 8(3), 223-241.
- Facione, P. (1990). *The Delphi Report*. Milbrae, CA: The California Academic Press.
- Facione, P. (2000). The disposition toward critical thinking: Its character, measurement and relationship to critical thinking skill. *Informal Logic*, 20(1), 61-84.
- Facione, P. (2015). *Critical thinking: What it is and why it counts*. Retrieved February 2014, from <https://blogs.city.ac.uk/cturkoglu/files/2015/03/Critical-Thinking-Articles-w6xywo.pdf>
- Facione, P., & Facione, N. (1992). *The California critical thinking dispositions inventory*. Milbrae, CA: California Academic Press.
- Facione, P., Facione, N., & Giancarlo, C. A. (2001). *California critical thinking disposition inventory: CCTDI*. California Academic Press.
- Ferrari, M. (2011). What can neuroscience bring to education? *Educational Philosophy and Theory*, 43(1), 31-36.
- Fisherman, D. (2013). What is critical thinking - A review of the literature. Unpublished.
- Fisherman, D. (2014a). Perceived questionability and the phenomenology of critical disposition. *Philosophy of Education Archive*, 95-103.
- Fisherman, D. (2014b, July 14). *Wittgenstein and the value of meaningless questioning*. Retrieved from <https://montclair.academia.edu/DanielFisherman>

- Fisherman, D., & Weinstein, M. (2015). *Cognitive science, reason and emotion - Some consequences for education*. Retrieved from <https://montclair.academia.edu/DanielFisherman>
- Fodor, J. (1983). *The modularity of mind*. Cambridge, MA: MIT Press.
- Fodor, J. (1987). Modules, frames, fridgeons, sleeping dogs, and the music of the spheres. In Z. Pylyshyn (Ed.), *The robot's dilemma: The frame problem in artificial intelligence* (pp. 139-149). Norwood, NJ: Ablex.
- Fodor, J. (2008). *LOT 2: The language of thought revisited*. Oxford: Oxford University Press.
- Foucault, M. (1977). *Discipline and punish*. Vintage.
- Frankish, K. (2010). Dual-process and dual-system theories of reasoning. *Philosophy Compass*, 5(10), 914–926.
- Freeman, W. (2000). Mesoscopic neurodynamics: From neuron to brain. *Journal of Physiology*, 94(5), 303-322.
- Freire, P. (1996). *Pedagogy of the oppressed*. London: Penguin Group.
- Freire, P. (2009). Under the shade of a mango tree. In T. Lewis, J. Grinberg, & M. Lavery (Eds.), *Philosophy of education: modern and contemporary ideas at play* (pp. 388-402). Dubuque: Kendall Hunt.
- Gall, M. (1970). The use of questions in teaching. *Review of Educational Research*, 40(5), 707-721.
- Gall, M. (1984). Synthesis of research on teachers' questioning. *Educational Leadership*, 42(3), 40-47.

- Gallagher, S. (2005). *How the body shapes the mind*. Clarendon Press.
- Gallagher, S. (2010). Phenomenology and non-reductionist cognitive science. In D. Schmicking, & S. Gallagher (Eds.), *Handbook of phenomenology and cognitive science* (pp. 21-34). Springer Netherlands.
- Geake, J. (2011). Position statement on motivations, methodologies, and practical implications of educational neuroscience research: fMRI studies of the neural correlates of creative intelligence. *Educational Philosophy and Theory*, 43(1), 44-47.
- Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. New York: Palgrave MacMillan.
- Giancarlo, C. A., Blohm, S. W., & Urdan, T. (2004). Assessing secondary students' disposition toward critical thinking: Development of the california measure of mental motivation. *Educational and Psychological Measurement*, 64(2), 347-364.
- Giorgi, A. (1997). The theory, practice, and evaluation of the phenomenological method as a qualitative research procedure. *Journal of Phenomenological Psychology*, 28(2), 235-260.
- Giroux, H. (1983). *Theory & resistance in education - A pedagogy for the opposition*. Massachusetts: Bergin & Garvey.
- Giroux, H. (1994). Toward a pedagogy of critical thinking. In K. Walters, *Thinking reason: new perspectives in critical thinking* (pp. 200-201). Albany: SUNY Press.

- Giroux, H. (2013, February 6). *Henry Giroux: The necessity of critical pedagogy in dark times*. Retrieved January 6, 2016, from <http://www.truth-out.org/news/item/14331-a-critical-interview-with-henry-giroux>
- Goodman, N. (1983). *Fact, fiction, and forecast*. Cambridge: Harvard University Press.
- Greene, M. (1988). *The dialectic of freedom*. New York: Teachers College Press.
- Greene, M. (2009). Teaching as possibility: A light in dark times. In S. Macrine (Ed.), *Critical pedagogy in uncertain times* (Vol. 1, pp. 137-149). Palgrave Macmillan.
- Greeno, J. G. (1994). Gibson's affordances. *Psychological Review*, 101(2), 336-342.
- Gupta, R., Koscik, T., Bechara, A., & Tranel, D. (2011). The amygdala and decision-making. *Neuropsychologia*, 49(4), 760-766.
- Gutman, A. (1987). *Democratic education*. Princeton, NJ: Princeton University Press.
- Haidt, J. (2012, October 7). *Reasons do matter*. Retrieved from NYTimes.com: http://opinionator.blogs.nytimes.com/2012/10/07/reasons-matter-when-intuitions-dont-object/?hp&_r=0
- Hebb, D. (1949). *The organization of behavior*. New York: Wiley & Sons.
- Heidegger, M. (1962). *Being and time*. San Francisco: Harper & Row.
- Heil, J. (2005). Dispositions. *Synthese*, 144(3), 343-356.
- Highmore, B. (2002). *The everyday life reader*. London: Routledge.
- hooks, b. (2009). Embracing change. In T. Lewis, J. Grinberg, & M. Lavery (Eds.), *Philosophy of education: Modern and contemporary ideas at play* (pp. 657-674). Dubuque: Kendall Hunt.

Howard-Jones, P. (2011). A multiperspective approach to neuroeducational research.

Educational Practice and Theory, 43(1), 24-30.

Husserl, E. (1970). *The crisis of european sciences and transcendental phenomenology:*

An introduction to phenomenological philosophy. Evanston: Northwestern University.

Husserl, E. (1977). *Phenomenological psychology: lectures, summer semester, 1925*. The

Hague: Matinus Nijhoff.

Ikuonobe, P. (2001). Questioning as an epistemic process of critical thinking.

Educational Philosophy and Theory, 33(3-4), 325-341.

James, W. (1890). *Principles of psychology*. New York: Henry Holt & Co.

James, W. (1925). *Talks to teachers on psychology: And to students on some of life's*

ideals. New York: Henry Holt and Company.

Kakkori, L. (2009). Hermeneutics and phenomenology problems when applying

hermeneutic phenomenological method in educational qualitative research.

Paideusis, 18(2), 19-27.

Kaku, M. (2014). *The future of the mind: the scientific quest to understand, enhance, and*

empower the mind. Doubleday.

Kellner, D., & Pierce, C. (2011). *Philosophy, psychoanalysis and emancipation:*

collected papers of herbert marcuse. London: Routledge.

Kiverstein, J. (2012). What is heideggerean cognitive science? In J. Kiversteing, & M.

Wheeler (Eds.), *Heidegger and cognitive science* (pp. 1-61). Palgrave Macmillan.

- Kuhn, T. (2012). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Kutner, M., Greenberg, E., Jin, Y., Boyle, B., Hsu, Y. C., & Dunleavy, E. (2007). *Literacy in everyday life: Results from the 2003 national assessment of adult literacy*. National Center for Education Statistics.
- Lewandowsky, S., H., U. K., Seifert, C., Schwarz, N., & Cook, J. (2012). Misinformation and its correction: Continued influence and successful debiasing. *Psychological Science in the Public Interest*, 13(3), 106-131.
- Lieberman, M. (2007). Social cognitive neuroscience: a review of core processes. (J. Forgas, & K. Williams, Eds.) *Annual Review of Psychology*, 58, 259-289.
- Lipman, M. (2003). *Thinking in education* (2nd ed.). Cambridge: Cambridge University Press.
- Lotman, Y. M. (1994, May). The text within the text. *PMLA*, 109(3), 377-384.
- Lutz, A., & Thomspon, E. (2003). Neurophenomenology. *Journal of Consciousness Studies*, 10(9-10), 31-52.
- Malabou, C. (2008). *What should we do with our brain?* (1 ed.). New York: Fordham University Press.
- Margolis, H. (1987). *Patterns, thinking, and cognition: A theory of judgment*. Chicago: University of Chicago Press.
- McKittrick, J. (2003). A case for extrinsic dispositions. *Australasian Journal of Philosophy*, 81(2), 155-174.

- McLaren, P., & Hammer, R. (1989). Critical pedagogy and the postmodern challenge: Toward a critical postmodernist pedagogy of liberation. *The Journal of Educational Foundations*, 3(3), 29-62.
- McLaughlin, B., & Bennett, K. (2011). *Supervenience*. Retrieved December 11, 2016, from <https://plato.stanford.edu/entries/supervenience/index.html>
- McPeck, J. (1981). *Critical thinking in education*. New York: St. Martin's Press.
- McPeck, J. (1990). critical thinking and subject specificity: A reply To Ennis. *Educational Researcher*, 19(4), 10-12.
- Merleau-Ponty, M. (2013). *Phenomenology of perception* (1st ed.). Routledge.
- Meyer, K., & Damasio, A. (2009). Convergence and divergence in a neural architecture for recognition and memory. *Trends in Neuroscience*, 32(7), 376-382.
- Moore, G. (1939). Proof of an external world. *Proceedings of the British Academy*, XXV.
- Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks: Sage Publications, Inc.
- Mulnix, J. (2012). Thinking critically about critical thinking. *Educational Philosophy and Theory*, 44(5), 464-479.
- Munhall, P. (2011). A phenomenological method. In P. Munhall (Ed.), *Nursing Research* (pp. 145-159). Jones & Barlett Learning.
- National Research Council. (1996). *National science education standards*. National Academy Press.
- Nieto, A., & Valenzuela, J. (2012). A study of the internal structure of critical thinking dispositions. *Inquiry: Critical Thinking Across the Disciplines*, 27(1), 1-38.

- Nussbaum, M. (2010). *Not for profit*. Princeton: Princeton University Press.
- Panksepp, J. (2005). Affective consciousness: Core emotional feelings in animals and humans. *Consciousness and cognition*, 14(1), 30-80.
- Panksepp, J. (2014). Integrating bottom-up internalist views of emotional feelings with top-down externalist views: Might brain affective changes constitute reward and punishment effects within animal brains? *Cortex*, 59, 1-6.
- Paterson, M., Higgs, J., & Wilcox, S. (2006). Developing expertise in judgement artistry in occupational therapy practice. *The British Journal of Occupational Therapy*, 69(3), 115-123.
- Paul, R. (1984). Teaching critical thinking in the 'strong' sense: A focus on self-deception, world views, and a dialectical mode of analysis. *Informal Logic*, 4(2), 2-7.
- Paul, R. (1993). *Critical thinking: What every person needs to know to survive in a rapidly changing world*. Santa Rosa: Foundation for Critical Thinking.
- Perkins, D. N., & Ritchhart, R. (2004). When is good thinking. In D. Y. Dai, & R. Sternberg, *Motivation, emotion, and cognition: Integrative perspectives on intellectual functioning and development* (pp. 351-384). Mahwah: Lawrence Erlbaum Associates.
- Perkins, D. N., Jay, E., & Tishman, S. (1993). Beyond abilities: A dispositional theory of thinking. *Merrill-Palmer Quarterly*, 39(1), 1-21.
- Perkins, D., & Salomon, G. (2012). Knowledge to go: A motivational and dispositional view of transfer. *Educational Psychologist*, 47(3), 248-258.

- Perkins, D., Tishman, S., Richhart, R., Donis, K., & Andrade, A. (2000). Intelligence in the wild: A dispositional view of intellectual traits. *Educational Psychology Review, 12*(3), 269-293.
- Richhart, R. (2001). From IQ to IC: A dispositional view of intelligence. *Roeper Review, 23*(3), 143-150.
- Rolls, E. (2013). *Emotion and decision-making explained*. Oxford: Oxford University Press.
- Roth, M. (2010). *Beyond critical thinking - The chronicle of higher education*. Retrieved October 15, 2016, from <http://www.chronicle.com/article/Beyond-Critical-Thinking/63288/>
- Ryle, G. (1949). *The concept of mind*. London: Hutchinson House.
- Scarantino, A. (2002). Affordances explained. *Philosophy of Science, 70*(5), 949-961.
- Scheffler, I. (1991). In praise of cognitive emotions. In *In praise of cognitive emotions* (pp. 3-17). New York: Routledge.
- Scheffler, I. (1995). The concept of the educated person. In I. Scheffler, & V. A. Howard, *Work, education, and leadership* (pp. 81-100). New York: Peter Lang.
- Searle, J. (1997). *The mystery of consciousness*. New York: New York Review of Books.
- Searle, J. (2015). *Seeing things as they are*. Oxford: Oxford University Press.
- Shanahan, M. (2016, Spring). *The frame problem*. (E. Zalta, Ed.) Retrieved from The Stanford Encyclopedia of Philosophy:
<<http://plato.stanford.edu/archives/spr2016/entries/frame-problem/>>

- Shanahan, M., & Baars, B. (2005). Applying global workspace theory to the frame problem. *Cognition*, 98(2), 157-176.
- Sharp, A. M. (1991). The community of inquiry: Education for democracy. *Thinking*, 9(2).
- Siegel, H. (1988). *Educating reason: Rationality, critical thinking and education*. New York: Routledge.
- Siegel, H. (1999). What (good) are thinking dispositions. *Educational Theory*, 49(2), 207-221.
- Splitter, L. J., & Sharp, A. M. (1995). *Teaching for better thinking - The classroom community of inquiry*. Melbourne: The Australian Council for Educational Research Ltd.
- Stanovich, K. (2009). Is it time for a tri-process theory. Distinguishing the reflective and the algorithmic mind? In J. Evans, & K. Frankish (Eds.), *In two minds: Dual processes and beyond* (pp. 55-88). Oxford: Oxford University Press.
- Strawson, P. (2002). Perception and its objects. In *Vision and mind* (pp. 91-110). Cambridge: The MIT Press.
- Thagard, P., & Aubie, B. (2008). Emotional consciousness: A neural model of how cognitive appraisal and somatic perception interact to produce qualitative experience. *Consciousness and Cognition*, 17(3), 811-834.
- Thompson, V. (2009). Dual-process theories: A metacognitive perspective. In *Two minds: Dual processes and beyond*. (pp. 171-195). Oxford: Oxford University Press.

- Thompson, V., Turner, J., & Pennycook, G. (2011). Intuition, reason, and metacognition. *Cognitive Psychology*, 63(3), 107-140.
- Tishman, S. (2001). Added value: A dispositional perspective on thinking. In A. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (pp. 72-75). Alexandria: Association for Supervision and Curriculum Development.
- Tishman, S., Jay, E., & Perkins, D. (1993). Teaching thinking dispositions: From transmission to enculturation. *Theory into Practice*, 32(3), 147-153.
- van Manen, M. (2008). Pedagogical sensitivity and teachers Practical knowing-in-action. *Peking University Education Review*, 1(1), 1-23.
- Vansieleghem, N. (2005). Philosophy for children as the wind of thinking. *Journal of Philosophy of Education*, 39(1), 19-35.
- Varela, F. (1996). Neurophenomenology: A methodological remedy to the hard problem. *Journal of Consciousness Studies*, 3(4), 330-350.
- Vygotsky, L. (1978). *Mind In society*. Cambridge: Harvard University Press.
- Wagner, T. (2012). *Creating innovators*. New York: Scribner.
- Webster, D., & Kruglanski, A. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology*, 67(6), 1049-1062.
- Weinstein, M. (2002). Exemplifying an internal realist model of truth. *Philosophica*, 69, 1-40.
- Weinstein, M. (2011). Arguing towards truth: The case of the periodic table. *Argumentation*, 25(2), 185-197.

Weinstein, M. (forthcoming). Cognitive science and the theory of emerging truth.

Proceedings of the 8th ISSA Conference. Amsterdam.

Wertsch, J., & Bivens, J. A. (1992, April). The social origins of individual mental functioning: Alternatives and perspectives. *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition*, 14(2), 35-44.

Wertsch, J., & Smolka, A. L. (1993). Continue the dialogue - Vygotsky, Bakhtin, and Lotman. In H. Daniels, *Charting the agenda - Educational activity after Vygotsky* (pp. 69-92). London: Routledge.

Willingham, D. (2007). Critical thinking. Why is it so hard to teach? *American Educator*, 31(3), 8-19.

Willingham, D. (2008). When and how neuroscience applies to education. *Phi Delta Kappan*, 89(6), 421-423.

Willingham, D. (2009). *Why don't students like school: A cognitive scientist answers questions about how the mind works and what it means for the classroom*. John Wiley & Sons.

Winstanley, C. (2009). Philosophy and the development of critical thinking. In M. Hand, & C. Winstanley (Eds.), *Philosophy in schools* (pp. 85-95). London: Continuum International Publishing.

Wittgenstein, L. (1969). *On certainty*. New York: Harper Torchbooks.

Wittgenstein, L. (2001). *Philosophical investigations*. Malden, MA: Blackwell Publishing.

- Wrathall, M. A. (2014). Hubert dreyfus and the phenomenology of human intelligence. In *Skillful coping: Essays on the phenomenology of everyday perception and action* (pp. 1-22). Oxford: Oxford University Press.
- Yang, S. a. (2009). Experimental study of teaching critical thinking in civic education in Taiwanese junior high school. *British Journal of Educational Psychology*, 79(1), 29-55.
- Zahavi, D. (2003). *Husserl's phenomenology*. Stanford: Stanford University Press.
- Zahavi, D. (2005). *Subjectivity and selfhood: Investigating the first-person perspective*. Cambridge, MA: MIT Press.
- Zahavi, D. (2010). Naturalized phenomenology. In D. Schmicking, & S. Gallagher (Eds.), *Handbook of phenomenology and cognitive science* (pp. 2-19). Springer Netherlands.

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