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A treatise on the outwardly nature of consciousness

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A Treatise on The Outwardly Nature of Consciousness

A Thesis Submitted to

The Department of Philosophy

In Partial Fulfillment of the Requirements

For the Degree of Master of Arts

By

Ramy Amin

Under the supervision of **Dr. Robert W. McIntyre**

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Abstract

In this thesis we propose a sketch towards an outwardly understanding of the nature of consciousness. We begin by arguing that all thought involves phenomenal character, then establish that all phenomenal character involves phenomenal concepts, which allows us to conclude that all thought involves phenomenal concepts. Finally, we survey the philosophical theoretical space to ground our thesis within established theories of consciousness, perception, and epistemology.

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Introduction

In the start of their book *Philosophy in the Flesh*, George Lakoff and Mark Johnson identified three main findings of cognitive science which they claim stand in opposition to most classical philosophical traditions. These are: "The mind is inherently embodied. Thought is mostly unconscious. Abstract concepts are largely metaphorical"[1]. They proceed to explain that our understanding of reason has a bearing on our understanding of what it is to be human. They cite Cartesian mind/body duality, Kantian transcendentalism, and phenomenology as some of the traditions which dictated and skewed our conception of the nature of rationality, cognition, and consciousness, mainly due to their speculative nature rather than their dependence on empirical data.

This thesis follows on the footsteps of Lakoff and Johnson and many philosophers of mind, especially on the analytic side, who take the empirical side of philosophy to heart. The first claim is that the nature of consciousness itself does not allow for what we would refer to as completely subjective thinking, or inward thinking, that is thinking which is completely isolated from the world. We rather argue that since the nature of consciousness itself is outwardly, which means that it is constantly seeking stimuli, then thinking is also outwardly in nature. That is to say, not only do stimuli necessarily feature into our thinking, but they make it possible in the first place.

In the first and second chapter, we argue two propositions:

1. All thinking involves phenomenal character
2. All phenomenal character involves phenomenal concepts

which allow us to syllogistically conclude that:

∴ All thinking involves phenomenal concepts

[1] George Lakoff and Mark Johnson, *Philosophy in the Flesh*. (New York: Basic books, 1999), 25, E-Book.

To put it simply, since thinking always involves phenomenal character which is the direct product of coming in contact with stimuli, and since this phenomenal character is always accompanied by phenomenal concepts, then thinking necessarily involves phenomenal concepts.[2]

The thesis adopts a neurophilosophical theoretical framework, where we take it that the findings of neuroscience, along with related disciplines to the empirical study of mind such as cognitive psychology, are pivotal to our understanding of the nature of our consciousness. In the third chapter, we survey the philosophical theoretical space in order to ground our thesis within established doctrines of theories of consciousness, perception, and epistemology.

What we need to make clear is that we do not believe that Lakoff and Johnson's criticism of speculative philosophy is strictly directed towards the philosophers they named, but rather towards their contemporary following who still operate within these parameters which empirical research has put to the test. If we take Descartes for example, we will find that he was operating within the parameters of the most technological advancements of his time. As Michael O'Shea explains,

> "[i]n one important respect Descartes was breaking new ground. By comparing the workings of the brain with that of complex hydraulic machines, he was regarding the most technologically advanced artefacts of his day as templates for understanding the brain. This is a tradition that persists today; when we refer to computers and computational operations as models of how the brain acquires, processes, and stores information, for example. So while Descartes was hopelessly wrong in detail, he was adopting a modern style of reasoning"[3].

This is evident in Descartes break with the traditional Scholastic understanding of perceptual cognition. The Scholastics believed that

[2] Think of phenomenal character as the fuel that allows for there to be thought at all. While the content of a thought might not be that phenomenal character, if, say, the thought is about mathematics or about another thought, it is still only possible to have that thought because of the availability of *some* phenomenal character. Thus, phenomenal character is necessary for the process of thought but not necessarily to feature as its content.

[3] Michael O'Shea, *The Brain: A Very Short Introduction*. (New York: Oxford University Press, 2006), 16.

> perceptual cognition would take place in animals in the imagination, because they lack an intellect, so the imagination is the highest faculty they possess; whereas, in the case of human beings, it is in the higher faculty of the intellect that perceptual cognition (like intellectual cognition) takes place.[4]

Descartes, on the other hand, believed in a direct link between the intellect and information from sense organs through the imagination (located in the penial gland). Thus, the difference between him and the Scholastics was that "whereas the imagination in the mindless animal has only one input, a sensory one, that in the human being has a sensory and an intellectual input"[5]. This direct link allowed Descartes to then reject the modularity of the human mind, arguing for the unity of the soul, giving that chief among his metaphysical commitments was that a fragmented soul is incapable of having free will[6].

This brief account is not in defense of Descartes, but to showcase that the progress of philosophical inquiry has long depended on new advancements in our understanding of how the mind works. It thus seems odd that, in an age of such fundamental breakthroughs in our conception of the mind, thanks to advancements in neuroscience, cognitive science, biological psychology, etc., that these ideas did not correct, and automatically disqualify, certain classical philosophical conceptions which we held in such high regard only in virtue of having no way of decisively discrediting them. As the world moves more and more towards a better understanding of consciousness based on empirical findings, we find it imperative to follow suit and present a thesis which tracks and present some of the modern key discoveries regarding the nature of cognition and thought. In the same spirit of adopting the most technological advancement in philosophical inquiry, we begin our investigation into the nature of consciousness.

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[4] Stephen Gaukroger. *Descartes' System of Natural Philosophy*. (Cambridge University Press: 2002), 220
[5] Gaukroger, *Descartes'*, 220
[6] Gaukroger, *Descartes'*, 223

Chapter I: On Sensory Restriction

Section I: An Introduction to Sensory Restriction

1. Descartes, Empirically Speaking

In our introduction, we briefly touched upon Descartes conception of perceptual cognition. To explicate more, Descartes maintained that it involves three things

> The first is the corporeal world, the second the pure intellect, which contains abstractions, and the third the imagination, which is a corporeal organ which Descartes will later identify with the pineal gland.[7] […] The intellect understands 'five-ness' as something separate from five objects (or line segments, or points, or whatever), and hence the imagination is required if this 'fiveness' is to correspond to something in the world.[8] […] The imagination represents to itself the contents of the world and it represents to itself the contents of the intellect, and perceptual cognition takes place when it maps these on to one another.[9]

What we want to do in this chapter is to take an empirical look at this claim. What we essentially argue is that there cannot be any thought without some kind of perceptual cognition resulting in phenomenal character[10]. That is to say, that there cannot be a notion of 'fiveness' without the mind receiving stimulation which allows it to cognize of the notion. Keep in mind this does not say that the stimulus must be the number 5, but rather that there needs to be *any* type of stimulation for consciousness to operate as we know it. What this idea essentially disqualifies is notions such as Avicenna's Floating Man argument, which postulates the possibility of the suspension of sensory experience to argue for the persistence of the soul independent of the body, or that for a mental state to be conscious there needs to be a higher order thought, as Rosenthal argues. What we are

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[7] Stephen Gaukroger. *Descartes' System of Natural Philosophy*. (Cambridge University Press: 2002), 218.

[8] Gaukroger, *Descartes'*, 219

[9] Gaukroger, *Descartes'*, 220

[10] The phenomenal character is what it is like for one to undergo a certain experience. Given the debate around what that term means, we want to explain that we use it to mean any subjective experience under the threshold of an explicitly propositional thought at time *t*, including sensations, representations, etc. More on that will come in our discussion of A/P consciousness in chapter 2. This is different from quale-consciousness as the recognition or identification of a specific what-it-is-like which would involve an explicitly propositional thought.

rather arguing that without stimulation from the world, consciousness becomes in danger. This means that consciousness is not only a tool to receive stimulation, but also a tool to seek it. The implication of that includes that an idea such as inward thinking, i.e. thinking which is completely isolated from worldly stimulation, would not be possible since all thinking involves the residual phenomenal character which is the result of the brain coming in contact with a stimulus. Thus, we argue that *all thinking involves phenomenal character*.

Since the claims regarding the nature of cognition are empirical in nature, we will take a look at it from an empirical standpoint. The way to do that is to look at what exactly happens if we deprive the brain from stimulation. In modern psychology, this can be induced in two ways: sensory and perceptual deprivation. Sensory deprivation, or SD, is defined as "an experimental environment designed to provide absolute reduction of intensity of input"[11] such as "conditions of darkness or silence"[12], while Perceptual deprivation, or PD, is "an experimental environment designed to provide solely homogeneous and unpatterned input" [13] such as "conditions of homogenous visual stimulation"[14]. In both cases, the subject's exposure to worldly *stimuli* is interrupted in order to test his/her reaction to such interruption. However, before we look at sensory restriction, let us take a moment to ponder upon the connotations the word *stimulus* has.

2. On *Stimuli*

The Latin *stimulus* denoted a "pointed stick to goad animals", and the verb *stimulare* "was used metaphorically for 'something that incites or causes a response'"[15]. The Latin *stimulāre* initially

[11] A. Michael Rossi, "General Methodological Considerations," in *Sensory Deprivation: Fifteen Years of Research*, ed. John P. Zubek (New York: Appleton-Century-Crofts, 1969), 18.
[12] Marvin Zuckerman, "Variables Affecting Deprivation Results," in *Sensory Deprivation: Fifteen Years of Research*, ed. John P. Zubek (New York: Appleton-Century-Crofts, 1969), 50.
[13] Rossi, "General Methodological Considerations," 19.
[14] Zuckerman, "Variables," 50.
[15] Lemma stimulate, in: *Word Origins*, John Ayto, A&C Black, 2nd ed., 2006. *Credo Reference*, https://search.credoreference.com/content/entry/acbwordorig/stimulate/0?institutionId=6166. Accessed 29 March 2019.

meant "to urge forward (an animal) with a goad or a sim" and "to incite to action, spur on, urge, instigate"[16]. It evolved in English to become *stimulate* which means "to prick, sting, afflict"[17], and in German *stimuli* means Ansporn, Anregung[18] and variants of the verb *stimulate* include anregen[19], anstacheln and anspornen [to spur on][20]. What, upon closer reflection, turns out to be problematic, is that in all cases, the word denotes a *stationary recipient*. Especially the verb *anspornen* which means 'to urge on', is suggesting a more or less idle and inactive party which is not anticipating a provocation.

We seek to challenge this connotation in this thesis. We take stimulus to denote any disturbance in the environment which falls within the spectrum of frequencies the conscious mind would be capable of receiving and categorizing, however, *with an anticipatory attitude from the receiver end*. Instead of changing the word, we continue to use it to reflect the role that the environment plays in the process of perception, and to maintain a naturalistic flavor in our discussion. However, the semantic adage here, adding anticipation to stimulation, will prove important in the lines to come. With that out of the way, let us then take a deeper look at both types of sensory isolation.

3. The Issue with Sensory Restriction

Consider the following account of nurse Winnifred Kelm from a 1961 experiment described by Mical Raz as "one of the few detailed first-hand descriptions of sensory deprivation experiments"[21]. Raz reported that Kelm spent 8.5 days in a dark isolated room where she was instructed to move

[16] P. Glare, *Oxford Latin Dictionary* (2nd ed.), (New York: Oxford University Press, 2012).
[17] J. A. Simpson & E. S. C. Weiner, *The Oxford English Dictionary* (2nd ed.), (Oxford: Oxford University Press, 1989). http://www.oed.com.libproxy.aucegypt.edu:2048/view/Entry/190374. Accessed 13 April 2019
[18] M. Clark & Thyen, O, *Concise Oxford-Duden German Dictionary*, (Oxford: Oxford University Press, 1991), 586.
[19] Clark, *Concise Oxford-Duden*, 586
[20] Clark, *Concise Oxford-Duden*, 748
[21] Mical Raz. "Alone again: John Zubek and the troubled history of sensory deprivation research." *Journal of the History of the Behavioral Sciences* 49, no. 4 (Fall 2013): 379, https://doi.org/10.1002/jhbs.21631

as little as possible and had no contact with any of the examiners. She was not to brush her teeth and was even discouraged from thinking too much. She wore rubber earmuffs which both restricted her movement on the bed, preventing her from tossing and turning, and isolated her from any noise. Within a few days, Kelm had entered a state of complete hallucination where, in her mind,

> her husband, a psychology graduate student, had been in an accident. She rushed to the hospital, only to find her husband's lifeless body being wheeled away. The experimenter's report, who observed her throughout her isolation, indicated that she had cried constantly one entire afternoon and throughout most of the night. When she emerged from the experiment, after eight and a half days, she was confused, disoriented, and irritable.[22]

However, not all the literature on sensory restriction has had such wild reports. Vernon & Hoffman (1956), from the research program at Princeton University, were first to report that "SD might have beneficial effects on intellectual performance"[23]. A group of psychologists in Richmond, between 1958 and 1963, have conducted studies to improve "the self-image of psychiatric patients who underwent sensory deprivation and heard appropriate messages"[24]. How, then, can two completely different outcomes occur under the same conditions? To answer that, we need to take a look back at the history.

Section II: A Sketch of the History of Sensory Restriction Experiments[25]

We will begin by drawing a distinction between what we take to be the three main phases of sensory deprivation research: The McGill University phase, John Zubek's phase, and the modern phase. Each phase has its own characteristics and its own objectives. The McGill University

[22] Raz, "Alone again," 379.
[23] Austin Jones, "Stimulus-Seeking Behavior," in *Sensory Deprivation: Fifteen Years of Research*, ed. John P. Zubek (New York: Appleton-Century-Crofts, 1969), 139.
[24] Peter Suedfeld, "Introduction and Historical Background," in *Sensory Deprivation: Fifteen Years of Research*, ed. John P. Zubek (New York: Appleton-Century-Crofts, 1969), 12.
[25] Our review here is by no means exhaustive. However, it serves to illuminate some of the main reasons for the discrepancy of reported data between different SD and PD experiments throughout the years.

experiments are considered to have initiated the interest in sensory restriction research. In 1951, a group of psychologists led by D. O. Hebb, developed the experimental sensory deprivation technique. The primary drive for this was "an interest in Russian and Chinese brainwashing"[26] which was later confirmed by Hebb himself in a symposium held at Harvard Medical School[27]. The military side of the research objectives here was palpable in contrast to the line of research adopted by Zubek. Raz concretized the distinction when he maintained that "[w]hile in the setting of coercive interrogation, sensory deprivation was used to cause discomfort and anxiety, Zubek's research, they argued, involved 'lying in a dark, quiet room'."[28]. Zubek himself stated that part of his objective was to "solve problems such as life in isolated areas in the sparsely populated areas in Canada's north"[29].

The difference between the two lines of research was reflected in the results from the two phases. While the experience from Zubek's experiment was "often 'pleasant and relaxing' and had been proven effective as a means to help people stop smoking"[30], the McGill university experiments witnessed more dramatic results. In a PD experiment, Bexton, Heron, and Scott (1954) reported that "14 subjects were asked about their experiences. All of the subjects reported some visual sensations. Half of the subjects reported B-type[31] sensations; e.g. 'a row of little men, a German helmet.' Three subjects reported animated, integrated scenes of a cartoonlike character"[32]. In another PD experiment, Woodburn Heron (1961) reported that 25/29 of the

[26] Suedfeld, "Introduction and Historical Background," 9
[27] D. O. Hebb, "Introduction," in *Sensory Deprivation: A Symposium Held at Harvard Medical School*, ed. P. Solomon et al. (Cambridge: Harvard University Press), 6.
[28] Raz, "Alone again," 390.
[29] No author. (1972). Brainwashing "not the object of research". Winnipeg Free Press, March 9, quoted in Raz, "Alone again," 389.
[30] Raz, "Alone again," 390.
[31] A-Type Hallucinations are simple in nature (flashes of light, shapes, etc.), while B-Type are more complex (integrated or animated sensation/perceptions) – Zuckerman, "Hallucinations," 94.
[32] Marvin Zuckerman, "Hallucinations, Reported sensations, and Images," in *Sensory Deprivation: Fifteen Years of Research*, ed. John P. Zubek (New York: Appleton-Century-Crofts, 1969), 95.

subjects reported “some form of hallucinatory activity”, as well as a general lack of control over the hallucinations and an inability to start or end them[33]. In this experiment,

> [the images] were often quite vivid and could not be terminated at will. Only three of the subjects believed that the phenomena were "real" and produced by outside sources. There was considerable movement in the RVSs[34]. The onset of the sensations varied from 20 minutes to about 70 hours. Some subjects did not report them until they became very compelling, and four subjects did not report them until the experiment was completed.[35]

In Heron et al. (1956), the 3 experimenters put themselves under perceptual deprivation for 6 days. They experienced what can be described as an escalating effect of PD. After one day, they reported

> simple visual disturbances such as dots and patterns to more complex experiences (i.e. scenery and people). After 6 days of isolation, they found they experienced a variety of visual disturbances including apparent movement of objects in the visual field, apparent movement associated with head/eye movements, distortions of shape, accentuation of after images and effects on the perception of colour and contrast.[36]

Now let us consider some of the findings of the Zubek phase. In 1964, he published a paper titled “Behavioral Changes After Prolonged Perceptual Deprivation (No Intrusions)”. In it, he concluded, after running a perceptual isolation experiment for a week, that “increasing the severity of perceptual deprivation above that of our earlier experiments did not affect the incidence of hallucinations and post-isolation distortions of the perceptual environment. Both phenomena were rare”[37]. The stark contradiction between this and the findings from the McGill experiments and Heron et al. (1956) might throw the reader off, until Zubek maintains, one page later, that “[t]his discrepancy in results may be due to two procedural differences. First, our Ss wore no gauntlet-

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[33] Woodburn Heron, “Cognitive and Physiological Effects of Perceptual isolation,” in *Sensory Deprivation: A Symposium Held at Harvard Medical School*, ed. P. Solomon et al. (Cambridge: Harvard University Press), 16-17.
[34] RVS is short for Reported Visual Sensations and RAS is short for Reported Auditory sensations. This is different from RAS which is short for Reticular activating system which will be discussed later on.
[35] Zuckerman, “Hallucinations,” 96
[36] Donna M Lloyd et al., "A qualitative analysis of sensory phenomena induced by perceptual deprivation," *Phenomenology and the Cognitive Sciences* 11, no. 1 (2012): 97. https://doi.org/10.1007/s11097-011-9233-z
[37] John P Zubek, "Behavioral changes after prolonged perceptual deprivation (no intrusions)." *Perceptual and Motor Skills* 18, no. 2 (1964): 413.

type gloves and hence received more tactile stimulation than did the McGill Ss. Second, our procedure involved *occasional intrusions* with visual test material in which the translucent goggles were briefly removed"[38]. One here must ask the reason why the title had "*no intrusions*", while a page later the experimenter admits to *clear intrusions* which would facilitate the subjects with sufficient sensory stimulation. In earlier experiments, Zubek and others were also able to report that "[v]isual sensations of the simple A variety were more frequent in the SD condition while the more complex, type B RVS's were rare or absent in both conditions"[39]. Before we comment on the clear contradiction between Zubek's and The McGill Uni's findings, let us take a look at the modern phase.

In 2011, Lloyd et al. conducted a perceptual deprivation experiment on 31 undergraduate psychology students who were required to listen to white noise for 30 minutes while wearing goggles. The subjects relayed their experiences into a Dictaphone as they experienced them, which eliminated any delay in reporting. They reported that "[c]omplex auditory experiences were the most commonly reported perceptions"[40]. Their analysis, which contains a good deal of phenomenological description, revealed two key characteristics of the hallucinations: their spatial character (being out-there in the world instead of in the subject's mind), and "the perceiver's role as an active contributor to the experience"[41]. They explicitly stated that "the increase in spatial information allowed the participant to communicate more 'meaning' in the reported sensation and was therefore more similar to 'Type B' phenomena"[42]. This is in contrast to the subjects' perceptions of simple sensory variations which lacked meaning given the subjects attempt to relay

[38] Zubek, "Behavioral changes," 414. [emphasis added]
[39] Zuckerman, "Variables," 51.
[40] Lloyd et al., "A qualitative analysis," 100.
[41] Lloyd et al., "A qualitative analysis," 101.
[42] Lloyd et al., "A qualitative analysis," 102.

their experience without attaching them to something external[43]. This allows us to make the tentative assumption that meaning requires the externality of the stimuli.

In a 2004 visual deprivation experiment, Merabet et. al. reported that 10 out of 13 subjects, who had been blindfolded for 5 days, reported both simple and complex hallucinations, resulting in a conclusion that "rapid and complete visual deprivation is sufficient to induce visual hallucinations in normal subjects"[44]. This is in contrast to Zubek's conclusion earlier that type B hallucination were rare in both PD and SD. Another very important distinction from the Zubek experiment is that the subjects in Merabet et. al. reported no hallucinatory experiences "during periods of tactile stimulation such as Braille reading instruction or during fMRI sessions"[45]. This might clarify the reason why Zubek found hallucinations to be rare in his experiments given the sensory input which his subjects received periodically.

On the wider spectrum of inducing psychotic-like experiences (PLEs)[46] in normal population under sensory deprivation, Daniel et al. (2014) stated that "[i]n the modern era, several studies have attempted to use a sensory deprivation paradigm to induce PLEs in the normal population. Using more modern techniques, all studies were successful in inducing hallucinations of varying complexity in many of the participants"[47]. And in 2015, Daniel and Mason developed a model to predict PLEs during sensory deprivation. In both experiments, the conclusion indicated that sensory deprivation can be standardized as a low-risk non-pharmacological successful method

[43] Lloyd et al., "A qualitative analysis," 102.
[44] Lotfi B. Merabet et al., "Visual hallucinations during prolonged blindfolding in sighted subjects," *Journal of Neuro-Ophthalmology* 24, no. 2 (2004): 109.
[45] Merabet et al., "Visual hallucinations," 110.
[46] Psychotic experiences "generally refers to subthreshold forms of hallucinations and delusions"; although this definition is not standardized. – Yung, Alison R., and Ashleigh Lin. "Psychotic experiences and their significance." *World Psychiatry* 15, no. 2 (2016): 130.
[47] Christina Daniel et al., "Psychotic-like experiences and their cognitive appraisal under short-term sensory deprivation," *Frontiers in psychiatry* 5 (2014): 2.

of inducing PLEs[48,49]. This, again, is in contradiction to Zubek's remarks on the rarity of hallucinations.

A pattern starts to emerge: The results from the modern phase have been consistently in line with those from the McGill University phase, and both stand in contrast to Zubek's phase. This is due to the different motivations behind the three phases. The McGill University phase's concern with brainwashing lead to more strict conditions of sensory restriction which resembled the conditions of the modern phase, while Zubek's concern with the practical utilization of sensory restriction has led to looser conditions. This is not to argue that Zubek's research was not important; of course, it is. However, this is to argue that standardizing Zubek's results as a way to contradict the McGill University results and thus play down the effects of sensory restriction[50], which has seemed as a shared sentiment among the authors in his edited book, *Sensory Deprivation: Fifteen Years of Research*, was a mistaken judgment. Let us now identify what exactly are we looking for in the three phases.

Section III: High and Low Ends of Sensory Restriction

Finding commonalities between the three phases is an impossible task given the vastness of the literature. However, what we can determine are the high and low ends of the spectrum of effects attributed to sensory restriction and see how they affect consciousness. If we are able to prove that, in both the low and high points on the spectrum of sensory restriction effects, inward thinking is not possible, then all the spectrum in between these two points will abide by their character. Think

[48] Daniel et al., "Psychotic-like experiences," 7.
[49] Christina Daniel, and Oliver J. Mason. "Predicting psychotic-like experiences during sensory deprivation." *BioMed research international* 2015 (2015): 8.
[50] The difference in motivation lead to a difference in the experiments set up, which in turn lead to a drastic difference in results. Understandably, the historical context of the Zubek's phase is critical to the understanding of the deeper motivations of framing and adjusting the work to that particular end. For an in-depth look into this historical context, please refer to Raz (2013).

of the features of the two ends as the necessary features of a larger set, then every subset would have to include these necessary features in order to belong to this larger set. All that would remain is formulate our understanding of the nature of consciousness in light of the current data. With that out of the way, let us look at what we take to be the low and high ends of effects under sensory restriction[51], i.e. veridical somatic sensation and hallucinations.

1. The Low End

Under SD, subjects experience an increase in somesthetic sensation. It is believed that this is due to the fact that somesthetic sensation is the least restricted modality and thus it occupies more of the subject's field of attention in the absence of stimulation[52]. Under SD conditions, stress and other associated isolation effects have been linked to the subjects' recumbent position rather than a reduction in "the over-all level of sensory stimulation"[53]. Nonetheless, multiple results did support the hypothesis that "SD increases sensitivity to somesthetic stimuli because of a lack of competition from exteroceptive stimuli", making it easier for somesthetic stimulation to occupy a larger portion of the subjects' attention[54].

This continuous somesthetic stimulation, i.e. bodily discomfort, can be credited with stimulating the mind enough to constitute responding to a bodily presence which prevents the environment from being completely sensory restrictive. Lloyd et al. also agrees that "[p]erceptual deprivation is easier to control experimentally and does not produce the unwanted effects of social isolation or physical discomfort that sensory deprivation often can"[55]. Furthermore, in tests performed after the fact, SD alone affected recollection and recognition, without affecting speech

[51] The low end represents the least intense activity recorded under sensory restriction, and the high end represents the most intense.
[52] Zuckerman, "Variables," 53.
[53] Zuckerman, "Variables," 54.
[54] Zuckerman, "Theoretical," 420.
[55] Lloyd et al., "A qualitative analysis," 96.

or abstract thinking, while PD alone was linked to reduction in "numerical facility, verbal fluency, and abstract reasoning"[56]; which led to the conclusion that "PD seems to produce a more extensive cognitive and perceptual impairment than SD"[57].

Nonetheless, bodily stimulation under PD conditions has actually proved to be beneficial for subjects. In a 1963 experiment, Zubek found that "physical exercises during PD resulted in significantly less impairment in intellectual and perceptual motor tests, and less EEG change than in PD subjects, not required to exercise during the one-week period"[58]. Granted, however, that two-third of the subjects who underwent exercise quit before the end of the week, just like the non-exercise SD and PD groups, which indicates that the threshold for tolerance is crossed, despite the fact that exercise seemed to alleviate the effects of PD. Another positive effect of stimulation, this time under SD, is that, after a 3-day session, "[t]he post SD results tend to indicate that the SD subjects were benefiting from the learning during SD even though it was not reflected in their performance during SD"[59].

This indicates that the intervention of physical stimulation in sensory restriction can help the subject perform better in learning related activities. And if physical stimulation can provides the subject with sufficient stimulation to maintain a coherent level of thinking, then that lends support to the idea that bodily discomfort under SD has its own set of introduced effects which prevent the experience from being completely isolated; meaning that, there can be no *completely* sensory restricted experiment since, even in cases of strict SD, subjects tend to use their body as a

[56] Zuckerman, "Variables," 51.
[57] Zuckerman, "Variables," 51.
[58] Zuckerman, "Variables," 55.
[59] Zuckerman, "Variables," 65.

means for self-stimulation. As Zuckerman puts it, "confinement to a bed in a small cubicle for 8 hours produces generalized stress relative to a normal environment"[60].

We can here determine that inward thinking, in the low end of sensory restriction, does not occur since thinking under these circumstances is accompanied by *sensations* of bodily discomfort which produce a constant source of stimulation[61], which are accompanied with phenomenal character.

2. The High End

The high end which we identify here is hallucination. In Heron (1961), hallucinations were reported to have lasted for up to 70 hours. Additionally, "[a] number of studies have demonstrated that the reported visual sensations show a progression toward increasingly more complex and meaningful ones. The subjects first report diffuse blobs; then geometrical forms; then patterns; then objects; and, finally, integrated, animated scenes"[62]. Similarly, in Lloyd et al., "[t]hematic analysis of the data revealed there was a progression of spatiality in the phenomena reported during perceptual deprivation from noticing simple abstract variations in the stimulus array to fully immersive perceptions of complex multisensory events in the environment"[63]. Hallucinations are taken up as the high end of sensory restriction since they constitute consciousness' attempt at *positing* a world when the subject's connection with the world is disturbed. To understand this more, we need to take a deeper look into hallucinations.

[60] Zuckerman, "Variables," 58.
[61] Sensation refers to the subjective experience, and Stimulation refers to the relation with the outside stimulus.
[62] Zuckerman, "Theoretical," 420.
[63] Lloyd et al., "A qualitative analysis," 106.

Section IV: The Neuroscience of Hallucinations

1. On the Nature of Hallucination

We will begin this section not with the philosophical debate, but with the neurological data at hand. In his discussion of visual hallucinations in patients with Charles Bonnet syndrome (CBS)[64], Dominic H. Ffytche differentiates between mind's eye, as the inner world, and eye's mind (henceforth referred to as physical eye, to eliminate confusion), referring to the world around us. He maintains that specializations of brain regions resulted in the two taking place at different spatial points in the brain. While mind's eye corresponded to activity in the "frontal, parietal and medial temporal cortex", the physical eye corresponded to activity in "specialized visual cortical regions"[65]. Interestingly, during hallucination, "[a]ctivity changes invariably occurred within [physical eye], not mind's eye, regions, the content of a hallucination relating to the specialization of the eye's mind region activated"[66,67]. This was also supported by Santhouse et al. (2000). They were able to determine, using functional magnetic resonance imaging (fMRI), that "visual hallucinations [in CBS population] were related to phasic increases in activity within specialized visual cortex and that the location of the increases defined the type of experience reported"[68]. This

[64] CBS is a case of vision deterioration which leads to subjects experiencing hallucinations. Ffytche describes CBS hallucinations as being "silent, appear externally in the world, and are not under volitional control" – ffytche, "The Hallucinating Brain," 50.

[65] Dominic H. ffytche, "The Hallucinating Brain: Neurobiological Insights into the Nature of Hallucinations," in *Hallucination: Philosophy and psychology*, ed. Fiona Macpherson and Dimitris Platchias (Cambridge: MIT Press, 2013), 54

[66] Ffytche, "The Hallucinating Brain," 54

[67] Ffytche maintains that this has not been proven in other modalities mainly due to "our limited understanding of the cortical organization of higher auditory, tactile, olfactory, and gustatory function." He maintains, however, that "it seems likely that the same principle will apply, as hallucinations in these modalities are linked to cortical activation within their respective sensory system" – ffytche, "The Hallucinating Brain," 54. Further evidence to support this hypothesis is that, by reviewing the data from Lloyd et al. and Merabet et al, we find that when the first restricted both vision and hearing, subjects reported both visual and auditory hallucinations, but when the second only restricted vision, subjects reported no auditory or somatosensory sensations. This indicates that perhaps hallucinations occur only in the restricted modality and does not leak to other modalities by association; which would also indicate separate processing as we shall see in Zeki's account.

[68] A. M. Santhouse, R. J. Howard, and D. H. ffytche. "Visual hallucinatory syndromes and the anatomy of the visual brain." *Brain* 123, no. 10 (2000): 2055.

means that, if the brain region responsible for processing faces was active during hallucination, then subjects experienced face hallucinations, and if the brain region responsible for processing color was active during hallucination, then subjects experienced color hallucinations, and so on.

This means that the subject's visual hallucinatory experience occurs in the same brain region that is responsible for visual perception, and not the isolated region of the mind's eye where imagination takes place[69]. Here, the reader may claim that since imagination occurs in a different brain region, then that may indicate a form of inward thinking which can persist on its own. To that we say, we are not attempting to disprove the claim that there are exclusive brain regions which are responsible for thinking, of which we take imagination to be a form of, and which more or less occur *away*, though not separate, from perceptual systems. However, we have two arguments against this hypothesis of stand-alone imagination: one from brain activity under sensory restriction, the other from the perceptual nature of the hallucinatory experience.

2. The Argument from Brain Activity

Researchers observed a progressive decline in brain activity in long-term isolation accompanied with an increasing arousal in "skin conductance and body movement"[70]. One explanation here is that when the cerebral cortical-reticular, particularly the ascending reticular activating system (ARAS), fails to activate the brain given the deficiency of sensory input, there occurs an

[69] Note that, while this has been proven in the case of CBS, it has not been conclusively proven in cases of hallucinations under sensory restriction due to the difficulty of performing brain imaging without disrupting the subject's isolation, given the invasive nature of fMRI and EEG's inability to accurately determine the active brain region. However, a parallel can be drawn between PD and CBS in that both of them take a distorted visual input and produce a hallucinatory experience. Merabet et al. supports this hypothesis as they maintained that "[t]he visual hallucinations described in this study fit with the current diagnostic criteria for CBS. First, the hallucinations were often vivid and complex, not associated with hallucinations in other sensory modalities, and subjects were insightful as to their unreality. Second, the hallucinations were the direct result of compromised visual input, a common cause for CBS" - Merabet et al., "Visual hallucinations," 112. The best data we have at the moment come from Boroojerdi et al. 2000 who reported that pre and post deprivation fMRI imaging did show an increase in cortical excitability in the visual cortex.

[70] Zuckerman, "Theoretical," 418.

"efferent discharge which creates the neurophysiological equivalent of increased 'drive'", which accounts for the "increase in autonomic and adrenocortical[71] activity"[72]. This can explain how the body enters a state of self-stimulation under SD in order to maintain its touch with the world. Accordingly, even in cases of no hallucination, imagination would not persist on its own given the automatic response from ARAS to the lack of stimulation which produces bodily sensations that occupies the subject's perception. This gives further support to our initial demonstration that there is no biological possibility for a *completely* sensory restricted experience and shuts the door on stand-alone imagination.

3. The Argument from Binding, or the Perceptual Nature of Hallucinatory Experiences

As Revonsuo and Newman (1999) put it, "[t]he binding problem is, basically, the problem of how the unity of conscious perception is brought about by the distributed activities of the central nervous system"[73]. This involves two main issues: segregation and combination. Segregation refers to the brain's ability to segregate distinct elements within a complex sensory input, combination refers to the brain's ability to present such a divers and complex sensory input as a single experience. Two main camps emerge as central to the debate.

In the first camp, focused more on answering the combination question, Crick and Koch (1990) argue that binding is what generates the conscious experience, and in the second camp, which is focused more on the segregation question, Zeki and Bartels (1999)[74] introduce the idea

[71] Adrenocortical hormones are responsible for responding to stress.
[72] Zuckerman, "Theoretical," 418.
[73] Antti Revonsuo & James Newman, "Binding and Consciousness," *Consciousness and Cognition* 8, no. 2 (1999):123.
[74] Semir Zeki and Andreas Bartels, "Toward a theory of visual consciousness," *Consciousness and cognition* 8, no. 2 (1999): 225-259.

that binding is a post-conscious phenomenon[75], which is then formalized in Zeki (2007). The difference between the two camps is that for the first, if binding generates consciousness, then to accurately perceive a yellow square, processing of the color yellow and the shape square must either occur at the same time *t*, or there must be some place in the brain where the output from the processing of color and shape are bound. Their solution to the problem is to suggest that one of consciousness' functions "is to *present*[76] the result of various underlying computations"[77] and that this involves "an *attentional* mechanism that temporarily binds the relevant neurons together by synchronizing their spikes in 40 Hz oscillations"[78], and that "*objects for which the binding problem has been solved are placed into working memory*"[79].

However, what makes the theory of the second camp appealing is the fact that since the brain has distinct regions for the processing of different elements of the perceptual experience, or what we can refer to as spatial asynchrony in the processing of perceptual data, the processing time in each region differs from other regions, which suggests a temporal asynchrony in the processing of perceptual data. Experiments show that "[c]olor is perceived before motion by ~80 ms", and "locations are perceived before colors, which are perceived before orientations"[80]. Moreover, because of this difference in the time it takes to perceive different elements of a perceptual experience, "subjects consistently mis-bind the color perceived at time *t* to the motion perceived at

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[75] n.b this is in one sense of consciousness. We will get back to it in the next chapter.

[76] In section 7 of chapter 4 in his book *Consciousness Explained*, pp. 85-95, Dennett criticizes such rhetoric which presupposes a small homunculus sitting at a Cartesian theater where it is presented with representations from the outside world. However, Crick and Koch have argued that "[t]he hypothesis of the homunculus – a conscious entity, residing inside the skull, between the eyes and looking out at the world – is, in broad terms, how everyone thinks of him- or herself. It would be surprising if this overwhelming illusion did not in some way reflect the general organization of the brain" (569). – Francis Crick and Christof Koch, "A neurobiological framework for consciousness," in *The Blackwell Companion to Consciousness*, ed. Max Velmans and Susan Schneider (Maldon, MA: Blackwell Publishing, 2007), 569.

[77] Francis Crick and Christof Koch. "Towards a neurobiological theory of consciousness." *Seminars in the Neurosciences*, vol. 2 (1990): 272. [emphasis added]

[78] Crick & Koch, "Towards a neurobiological theory," 272. [emphasis added]

[79] Crick & Koch, "Towards a neurobiological theory," 272. [emphasis in original]

[80] Semir Zeki, "The disunity of consciousness," *Trends in Cognitive Sciences* 7, no. 5 (2003): 215.

time *t-1*"[81]. This means that the theory of the first camp, that "*objects for which the binding problem has been solved are placed into working memory*" is mistaken. Alternatively, what Zeki proposed to account for such spatial and temporal asynchrony is that when the brain attempts to bind together all the input from the different modalities, it "does not wait for each area to complete its processings; rather it simply binds what has been processed and reached a perceptual level"[82]. This translates to: perception as processing is itself a kind of consciousness, while binding as the conscious surface connection of the perceptual input from two or more modalities is post-conscious. In layman terms: you already know what you saw before you knew you saw it[83]. The two types of consciousness, and the two types of knowledge, will be discussed in detail in the coming chapters.

Furthermore, Zeki maintains that there exists no "mechanism to compensate for the perceptual time differences between [the brain's] specialized systems", nor is there "a final ' perception area ', equipped with a ' synchronizer ', which would receive information from all the different systems and bind it in the appropriate spatiotemporal way"[84,85]. Thus, it is "not surprising

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[81] Semir Zeki, "A Theory of Micro-consciousness," in *The Blackwell Companion to Consciousness*, ed. Max Velmans and Susan Schneider (Maldon, MA: Blackwell Publishing, 2007), 584.

[82] Zeki, "A Theory of Micro-consciousness," 584.

[83] Zeki maintains that "imaging experiments show that the same specific areas of the brain, specialized for the processing and seeing of houses or faces respectively, are active, regardless of whether the subjects saw the stimulus (were conscious of it) or not. The difference between the two states is that, in the former, the activity is higher than in the latter" – Zeki, "A Theory of Micro-consciousness," 582. The difference between these two types of consciousness is referred to by Ned Block as Access Consciousness and Phenomenal Consciousness and we will discuss them in more detail in a later chapter. For now, the reader should make the distinction between awareness as a feature of phenomenal consciousness, and attention as a feature of access consciousness. What Zeki means by the previous quote is that subjects were *aware* of the stimuli without it occupying their *attention*; and such awareness was sufficient to trigger brain activity and register as a perceptual experience, albeit with a lower activity than in the case of attention.

[84] Konstantinos Moutoussis and Semir Zeki. "A direct demonstration of perceptual asynchrony in vision." *Proceedings of the Royal Society of London. Series B: Biological Sciences* 264, no. 1380 (1997): 397.

[85] Note here that Zeki understands that this does not answer the question of how or where binding occurs, but that perceived consciousness of attributes of a perceptual experience occurs prior to such binding, and not after it as Crick and Koch postulated. Note also that he maintains that "it is also true that over longer periods of time, in excess of 500 ms, we do see different attributes in perfect temporal and spatial registration, which itself demands an explanation" – Zeki, "A Theory of Micro-consciousness," 584. On that view, ultimately, there is nothing that prevents there from being a process, perhaps involving higher centers of the brain, which correlates attribute perceived at time *t* with another at time *t+1*; provided that, in each times, the conscious experience has already been assigned to the attributes

that there is no terminal station in the cortex, since activity at each node represents, in a sense, a terminal stage of its own specialized process"[86].

Here's an attempt to make more precise Zeki's argument: since

- the processing sites in the visual brain are also perceptual sites; meaning they do not need further processing in higher brain centers for recognition to occur[87,88], and
- it has been demonstrated that there exists a temporal asynchrony in the processing of perceptual data[89],

Then that strongly suggest that "*binding is a post-conscious phenomenon*"[90]. Moreover, Zeki's argument received support from the findings of Zmigrod & Hommel (2010) who reported that "binding effects were entirely unrelated to conscious perception"[91,92]. The main argument they were trying to test is the assumption of Treisman (2003) that "feature integration is a necessary precondition for coherent conscious perception"[93] – the same assumption which Crick & Koch adopted. The task they set out to investigate is whether the probability that feature binding occurs

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of a perceptual experience before binding takes place, i.e. when two cognitions occur, the experiential value of each cognition has already been assigned to each before that cognition is bound to another by the perceptual/processing center, and not by a previous cognition.

[86] Zeki and Bartels, "Toward a theory of visual consciousness," 252.

[87] Zeki, "A Theory of Micro-consciousness," 581.

[88] He refers to "processing sites at which activity can acquire a conscious correlate and does not require further processing as *essential nodes*" – Zeki, "A Theory of Micro-consciousness," 582. The measured processing is correlated to brain activity that appears in imaging where no activation is detected in higher centers while activation remains localized in these essential nodes.

[89] Zeki, "The disunity of consciousness," 215.

[90] Zeki, "A Theory of Micro-consciousness," 584. [emphasis in original]

[91] Sharon Zmigrod and Bernhard Hommel. "The relationship between feature binding and consciousness: Evidence from asynchronous multi-modal stimuli." *Consciousness and cognition* 20, no. 3 (2011): 592.

[92] We need to voice our reservations regarding this particular claim. Although the jury is still out on the nature of binding, and the data suggests that consciousness is a pre-binding phenomenon, dismissing binding altogether seems odd. At least, the phenomenal character of a subject's experience of the world must have an impact on the subject's performance in any test; which means that, even if immediate binding of features does not correlate to conscious experience, phenomenal binding of relating together certain environmental sensations should not be disqualified from the discussion. In this particular case, we agree with a limited portion of the theory of the first camp. We include the study as support for Zeki since it further supports the data on subjects continuing to mis-bind; which stands in contrast to the central claims of the first camp. We will have more to say on that once we have introduced our Blockian model of consciousness.

[93] Zmigrod and Hommel, "feature binding and consciousness," 586.

is correlated with "the probability of perceiving the bound features as belonging to the same perceptual event, or, more specifically, as occurring at the same time"[94]. Consistent with the findings from Zeki (2003), they found no such correlation, which suggested that intermodal feature binding has nothing to do with perception of multi-modal features as belonging to the same event[95]. In other words, these findings suggest that "conscious experience of unity is not a prerequisite for, or a direct consequence of binding"[96].

If we add to this Ffytche demonstration that hallucination occurs in the same brain regions responsible for visual processing, then we see no reason for binding to treat hallucinations as anything but *cognitions*[97] since their perception has occurred already where they are processed. And if we take the phenomenal character of a perceptual experience to be the combination of all attributes of the perceptual experience which have been processed at time *t*, i.e. the phenomenal character as the result of binding, then *hallucinations too have a phenomenal character*. This runs counter to the disjunctivist view which states that "when one is hallucinating one's experience lacks phenomenal character altogether"[98,99].

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[94] Zmigrod and Hommel, "feature binding and consciousness," 592.
[95] Zmigrod and Hommel, "feature binding and consciousness," 592.
[96] Zmigrod and Hommel, "feature binding and consciousness," 586.
[97] On Peirce's definition, "[a]ny cognition is a consciousness of the object as represented" – Peirce, C. S. "Questions Concerning Certain Faculties Claimed for Man." *The Journal of Speculative Philosophy* 2, no. 2 (1868): 107.
[98] Fiona Macpherson, "The Philosophy and Psychology of Hallucination: An Introduction," in *Hallucination: Philosophy and psychology*, ed. Fiona Macpherson and Dimitris Platchias (Cambridge: MIT Press, 2013), 21.
[99] Of the same opinion is Merleau-Ponty who maintains that "[h]allucinations are played out on a stage different from that of the perceived world, and are in a way super-imposed" – Maurice Merleau-Ponty. *Phenomenology of perception*. (London; New York: Routledge, 1966), 395. And thus, argues that "the thing in hallucination is never seen and is never visible" – Merleau-Ponty, *Phenomenology*, 397. However, the very example he presents, "'Can't you hear my voices?' asks the patient; 'then I must be the only one to hear them'" Merleau-Ponty, *Phenomenology*, 395, is proof enough that the experience has been veridical enough for the experiencer to inquire whether or not it is intersubjective. Thus, much like the disjunctivists, Merleau-Ponty's argument that "[t]he fact that the hallucination does not take its place in the stable and intersubjective world means that it lacks the fullness" is provably false Merleau-Ponty, *Phenomenology*, 395.

Conclusion

To this point, we have argued two things: first, that in the low end of sensory restriction, inward thinking does not occur since thinking is accompanied by *sensations* – which constitute an element of the phenomenal character of a subject's experience, and second, that in the high end of sensory restriction, inward thinking does not occur since thinking is accompanied by *cognitions* – which constitute an element of the phenomenal character of a subject's experience. Thus, *there exists no thinking without a phenomenal character involved in it*.

What this also means, is that for consciousness to continue its wakeful manifestation, thought as we identified it earlier, it needs to keep a certain level of stimulation going – ranging from bodily sensations to a full positing of a world in hallucination – in order to have something to attach thought to. In other words, consciousness is not only stimuli-receiving but also *a stimuli-seeking*[100]*, and sometimes stimuli-generating, machine*. By this, we take it that we have demonstrated that: all thinking involves an underlying phenomenal character giving how consciousness is a stimuli-seeking machine.

Anticipating Criticism: Neuroplasticity as a Counter Argument

A counter argument can be made by utilizing neuroplasticity. What neuroplasticity means is the brains ability to change its structure to optimize the flow of information. A case can be made that, under prolonged sensory deprivation, the brain can start rewiring itself to ensure resuming its

[100] Psychologists call this "stimulus-action hunger" where subjects under conditions of sensory restriction seek to stimulate themselves through an increase in verbal output, somatic movement, etc. However, just like SD raises "the desire to think and to speak, […], at the same time, it appears that deprivation techniques disrupt the organized flow both of intrinsically motivated cognitive behavior and of its overt indicator, speech". This is why other indicators, biometric in nature, such as autonomic and adrenocortical activity, better help account for such level of drive. – Peter Suedfeld, "Changes in Intellectual Performance and in Susceptibility to Influence," in *Sensory Deprivation: Fifteen Years of Research*, ed. John P. Zubek (New York: Appleton-Century-Crofts, 1969), 132.

normal functions. Of course, we do not disagree with the idea since it has been empirically proven, however, we contest using it as an argument for the possibility of inward thinking. Consider the 1981 study by D. A. Winfield on "the effects of postnatal visual deprivation on synaptic density in the visual cortex"[101] . In this study, Winfield sutured "the eyelids over one eye in 6 kittens and over both eyes in 4 kittens", under ether anaesthesia, shortly before the natural time of eye-opening[102]. The interesting results came from the bilaterally visually deprived kittens. Their early synaptogenesis paralleled that of normal kittens, and their synaptic density was slightly below average after 40 days, and by the age of 70 days, their synaptic density deteriorated to 26% below average. Interestingly, however, unlike the control group who started synaptic pruning normally at the age of 70, the bilaterally restricted kittens showed a *slow increase* in synaptic density up to 13% above normal by the age of 110 days, and even showed a 22% increase compared to control animals after reaching maturity. This shows that "synaptic pruning is indeed influenced by environmental input", and that "that immature visual cortex, deprived of its normal input from the eyes, develops other afferent connections, including somatosensory ones, which form functioning systems"[103].

Moreover, other researchers reported that, in visually restricted kittens, neurons fail to respond to any visual stimuli, "although they are 'spontaneously' active"[104], despite the fact that "behaviorally, these animals appear blind when the opaque lenses are removed"[105]. Keep in mind that neuroplasticity goes both ways, which means that, these kittens, when later are *consistently* introduced to normal visual stimuli, "some degree of recovery of vision over time does occur even

[101] Peter R. Huttenlocher, *Neural Plasticity*. (Cambridge: Harvard University Press, 2009), 58.
[102] D. A. Winfield, "The postnatal development of synapses in the visual cortex of the cat and the effects of eyelid closure." *Brain research*, 208 (1981), 166.
[103] Huttenlocher, *Neural Plasticity*, 60.
[104] Huttenlocher, *Neural Plasticity*, 90.
[105] Huttenlocher, *Neural Plasticity*, 90.

when bilateral visual deprivation extends from birth to maturity"[106]. The interesting question here is: if these neurons continue firing *without* responding to stimuli, what kind of connections did they develop? "Might they have been recruited for functions other than visual?"[107]. There is a suggestion that the answer to that question is affirmative, since "inputs from the visual cortex to the suprasylvian association cortex are replaced by increased auditory and somatosensory inputs"[108]. Behavioral testing of the animals showed an "improved sound localization" compared to control animals, which suggests that these adaptations are functionally significant.

What this attempts to show is that neuroplasticity is *actively attempting to optimize neural connection to receive the best possible quality of stimuli from the environment*, and when it is unable to do so, it rewires the brain to divert resources in order to enhance the quality of feedback. And when the reason for the deprivation is removed, the brain attempts to wire back the connections to keep the feedback from the previously restricted modality flowing. Accordingly, we can conclude that the brain does whatever at its power to ensure that the connection with worldly stimuli is optimal, which gives further supports to our claim that the nature of consciousness is outwardly.

[106] Huttenlocher, *Neural Plasticity*, 90.
[107] Huttenlocher, *Neural Plasticity*, 90.
[108] Huttenlocher, *Neural Plasticity*, 110.

Chapter II: On Phenomenal Concepts

In the previous chapter, we argued that all thinking always involves Phenomenal Character given that the nature of consciousness is being outwardly. Towards proving the truth of this proposition, we presented Zeki's micro-consciousness theory and concluded that since binding is a post-conscious phenomenon, and since the perception as processing of stimuli itself is conscious, then the perceiver already knows what they saw before they know they saw it. We will refer to this type of knowledge as consisting of *phenomenal concepts* and will discuss in a minute where that term comes from. In this chapter, we want to take a deeper look at this knowledge claim, i.e. that there exists a type of knowledge of the world that is strictly phenomenal. Towards that end, we will need to answer, first, what is the *nature* of phenomenal concepts? (The Epistemic Question), second, are phenomenal concepts their own distinct category? do they really *exist*? (The Ontological Question), and third, to what extent do phenomenal concepts exert *control* over behavior? (The Behavioral Question). This part of the thesis will attempt at arguing the soundness of the second proposition which states that all phenomenal character involves phenomenal concepts. Before we begin to answer the epistemic question, a prologue is necessarily due.

Prologue: A/P Consciousness

Based on the work of Daniel Schacter, Ned Block proposes a theory of consciousness according to which there are, in fact, two kinds of consciousness: Phenomenal Consciousness (P-Consciousness) and Access Consciousness (A-Consciousness). Here's how Block envisions it: P-Consciousness is "experience," or more precisely, following Thomas Nagel, "what makes a state phenomenally conscious is that there is something 'it is like' […] to be in that state"[109], i.e.

[109] Ned Block. "On a Confusion about a Function of Consciousness," in *Consciousness, Function, and Representation: Collected Papers* (Cambridge: MIT Press, 2007): 163.

something it is like to experience the redness of a specific bottle in this room under this lighting.. The *function* of P-Consciousness, according to Block, is to act as "the gateway between the special purpose 'knowledge' modules and the central Executive System that is in charge of direct control of reasoning, reporting, and guiding action"[110]. The *operation* of P-Consciousness as a gateway involves "integrating the outputs of the specialized modules and transmitting the integrated contents to mechanisms of reasoning and control of action and reporting"[111]; the latter mechanisms are understood to be part of A-Consciousness. A state "is access-conscious roughly speaking if its content—what is represented by the perceptual state—is processed via that information-processing function, that is, if its content gets to the Executive System, whereby it can be used to control reasoning and behavior"[112].

It is important to note here that Zeki credits Block for the distinction between micro and macro-consciousnesses stating that "[m]icro- and macro-consciousnesses with their individual temporal hierarchies really refer to what has been coined as phenomenal consciousness, as opposed to access consciousness" [113]. P-Consciousness is similar to Zeki's understanding of binding. Binding occurs after the specialized 'knowledge' modules, which Zeki calls *essential nodes*, have already processed the stimuli and are ready to relay the information to the higher areas of the brain, which are the mechanisms of reasoning and control of action and reporting. Now that we have established the distinction between the two types of consciousness, we turn to ask our first question: what is the nature of this knowledge generated by phenomenal character?

[110] Block, "On a Confusion," 163.
[111] Block, "On a Confusion," 163.
[112] Block, "On a Confusion," 164.
[113] Zeki, "A Theory of Micro-consciousness," 585.

Section I: The Epistemic Question

- The purpose of this section is to propose the Blockian vision of the nature of phenomenal concepts and argue that the *meaning* of phenomenal concepts depends, *in part*, on the *effect* of the phenomenal character of the experience on a subject. This is based on Block's hypothesis that information travel from the specialized modules to A-consciousness through P-consciousness.

In his rebutting of the Property Dualism Argument, Block introduced the idea of a *phenomenal concept*. A phenomenal concept is "individuated with respect to fundamental uses that involve the *actual occurrence* of phenomenal properties. In these fundamental uses, a simultaneously occurring experience is used to think about that very experience. No one could have a phenomenal concept if they could not in some way relate the concept to such fundamental uses in which the subject actually has a simultaneous instance of the phenomenal quality"[114]. Note that a phenomenal concept should be distinguished from what we will call a *linguistic symbolic concept*. A *symbolic concept* does not rely directly on the *actual occurrence* of a certain phenomenal quality, yet may involves a multiplicity of phenomenal concepts. It relies fundamentally on the Executive system's operations of information-processing, which makes it primarily A-Conscious despite, like every other A-operation, relying on P-Consciousness.

This idea of a phenomenal concept allows him to argue against the Property Dualism, argued for by Frank Jackson, who claimed that Mary[115] would know something different when she

[114] Ned Block. "Max Black's Objection to Mind-Body Identity," in *Consciousness, Function, and Representation: Collected Papers* (Cambridge: MIT Press, 2007): 438.

[115] Frank Jackson was the first to introduce Mary's problem in his 1982 paper titled "Epiphenomenal Qualia". In it, he argues: "Mary is a brilliant scientist who is, for whatever reason, forced to investigate the world from a black and white room *via* a black and white television monitor. She specialises in the neurophysiology of vision and acquires, let us suppose, all the physical information there is to obtain about what goes on when we see ripe tomatoes, or the sky, and use terms like 'red', 'blue', and so on. She discovers, for example, just which wave-length combinations from the sky stimulate the retina, and exactly how this produces *via* the central nervous system the contraction of the vocal chords and expulsion of air from the lungs that results in the uttering of the sentence 'The sky is blue'. […] What will

experiences the color red for the first time. Rather than her learning a new "property" of the color red, Block argues that "the new knowledge acquired does not show that there are any properties beyond the physical properties" since, in personal encounter of the color red, there exists only "a new concept but no new properties or facts"[116], i.e. a new way of conceiving of red. Block continues to say that the manner in which Mary would express what she learned about the phenomenal concept of seeing the color red is something like: "Oh, so *this* is what it is like to see red"[117], where the italicized 'this' would refer to what we arbitrarily call 'redness'.

However, since P-consciousness is the binding of the information relayed from the specialized modules regarding a perceptual experience, and A-consciousness involves the mechanisms of reasoning and control of action and reporting, then Mary's *reporting* on the phenomenal concept of 'redness' is actually *not* the true expression of the phenomenal concept itself, but rather a translation of the phenomenal concept into a *linguistic symbolic concept* through engaging the reporting aspect of A-consciousness. That is to say, that *the true expression of the phenomenal concept is incommunicable*. This is precisely the reason why it is impossible to explain redness to a blind person: we can communicate the *linguistic symbolic concept* with the word-token 'red', but we cannot communicate the *phenomenal concept* about the phenomenal character of a definite redness. Block himself seems to have something similar in mind when he explains that, "[i]n the case of language-using organisms such as ourselves, a major symptom of

happen when Mary is released from her black and white room or is given a colour television monitor? Will she *learn* anything or not? It seems just obvious that she will learn something about the world and our visual experience of it. But then it is inescapable that her previous knowledge was incomplete. But she had *all* the physical information. *Ergo* there is more to have than that, and Physicalism is false." – Frank Jackson, "Epiphenomenal Qualia." *The Philosophical Quarterly* 32, no. 127 (1982): 130.

[116] Block, "Max," 438.

[117] Block, "Max," 441.

access-consciousness would be *reportability*" [118] , and since phenomenal concepts are incommunicable, then what is communicable must be another type of concepts, i.e. symbolic.

Now, since both the phenomenal content and concept are interlinked given the condition of *actual occurrence* which guarantees their simultaneous generation, and if the phenomenal concept of a definite redness is instantiated from the phenomenal character of experiencing a definite color red, then the *meaning* of the phenomenal concept of redness should depend, *in part*[119], on the *effect* of the phenomenal character of experiencing the color red. The question here is: what would be the *effect* of the phenomenal character of experiencing the color red? Remember that in the first chapter we identified phenomenal character roughly as any subjective experience under the threshold of an explicitly propositional thought, including sensations, cognitions, etc. But since cognitions are under the control of internal mental processes, and since it is impossible to account for any propositional thought at any given time by way other than reportability—which would translate the P-conscious into an A-conscious state—the only thing we can account for of a phenomenal character *qua* phenomenal character is *feelings*. Any feeling must involve a correlate activity from the sympathetic nervous system as an involuntary reaction of the body to external stimulation, be it a perceptual experience – e.g. the color red or a cardinal stimulus, or direct sensation – e.g. the sensation of pain. The sympathetic nervous system, which is part of the larger autonomic nervous system, releases the appropriate chemicals in order to induce the correlative feeling—a process that happens automatically. Accordingly, we can claim that one of the areas

[118] Block, "Max," 144.
[119] We say *part* and not *all* because, as we shall see in the following section, the meaning of a stimulus can be just the discrimination of certain information about said stimulus – specifically in the case of the absence of p-conscious experience. Block seems to agree that phenomenal concepts are "partially constituted' by phenomenal qualities". – Levin, Janet. "What is a phenomenal concept?" in Phenomenal Concepts and Phenomenal Knowledge: New Essays on Consciousness and Physicalism, eds. Torin Alter & Sven Walter (Oxford: Oxford University Press, 2006), 91.

where we can measure that phenomenal character is the *emotional effect* the color has over the subject. The question now becomes, how do we measure such effect?

In a 1994 study by Patricia Valdez and Albert Mehrabian, they were able to determine that, antithetical to brighter colors, darker colors were linked to lower pleasure (P), higher arousal (A) and higher dominance-inducing (D)[120]; or to put it concisely: "Brightness = +P -A -D, Darkness = -P +A +D"[121]. At the same time, other research that provided measures of aggression and anger based on the same parameters of pleasure, arousal and dominance, arrived at the following values: "Aggression = -.36 P +.20 A +.28 D, Anger = -.74 P +.36 A +.09 D". By correlating these results, Valdez and Mehrabian concluded that "darker colors are likely to elicit feelings that are similar to (or weaker variants of) anger, hostility, or aggression. Darker colors are also expected to elicit feelings that constitute components of aggression, anger, or hostility (e.g., displeasure, high arousal, or dominance)"[122]. Now, while maintaining the condition of actual occurrence, and if we now take the meaning of a phenomenal concept to depend in part on the *effect* of phenomenal character, then we can claim that in perceiving a darker color, the phenomenal character of that perceptual experience would include feelings of arousal and dominance, while the phenomenal concept that manifests inches towards anger, hostility, or aggression, or elicit feelings of displeasure, high arousal, or dominance.

The counterargument here might go along these lines: feelings as involuntary sympathetic nervous system reactions are not accompanied with any phenomenal concepts, but only

[120] The Pleasure-Arousal-Dominance (PAD) Emotion Model was suggested by Mehrabian and Russell (1974) where they studied pleasure (+P) – displeasure(-P), arousal (+A) – nonarousal (-A), and dominance (+D) – submissiveness (-D) as a way to provide a general description of emotions. Some of the readings under that model include: +P+A+D correlated with feelings of being "admired, bold, creative, powerful, vigorous", +P – A – D correlated with feelings of being "consoled, docile, protected, sleepy, tranquilized" – Valdez and Mehrabian, "Effects of Color," 395.
[121] Patricia Valdez and Albert Mehrabian. "Effects of color on emotions." *Journal of experimental psychology: General* 123, no. 4 (1994): 407.
[122] Valdez and Mehrabian, "Effects of color," 408.

phenomenal characters that are accompanied by concepts. Each category, phenomenal characters and concepts, is distinct on its own and there's no overlap between the two. The idea that is generated in someone's stream of consciousness when they see red is the same as when they think red. To answer these potential disagreements, we now turn to try and answer our ontological question.

Section II: The Ontological Question: Two Possible Routes

- So far, we've argued that part of the meaning of a phenomenal concept is the phenomenal character a perceptual experience has over the subject. What this might suggest is a deflationary approach where it might be argued that phenomenal concepts are *just* feelings, or an eliminative approach whereby phenomenal concepts are denied altogether. The purpose of this section is to argue for the existence of phenomenal concepts as their distinct category of concepts and to refute the attempt to collapse phenomenal concepts into phenomenal character or deny their existence. The idea is to showcase *a special type of direct connection* between the specialized modules and A-consciousness in the case in which there is no P-consciousness which *allows* the executive system to *guess* (or *vaguely discriminate*) information about certain stimuli, despite the information not passing through, or registering any feelings, in P-consciousness. We believe this is a common mistake since guessing and certainty are two different epistemic modes which should not be conflated.

To answer our question here, we need to untangle phenomenal concepts and phenomenal contents. That is to say, we need to find cases in which, on the one hand, a stimulus has no phenomenal

character while, on the other, a phenomenal concept can be observed taking part in rational behavior.

We have seen in the previous chapter how Zeki utilizes the temporal discrepancy in processing certain stimuli to argue his case for micro-consciousness. Zeki's method does not allow us to investigate each of them separately. On the other hand, Block's hypothesis allows us to do exactly that. Block presented his hypothesis in light of a discussion of patients with damage to their primary visual cortex which results in blind areas in their visual field. When presented with a stimulus—say a vertical line—in their blind field, the patients deny having any representation of that stimulus. Remarkably, some blindsight patients, despite having no A-conscious representation of the stimulus, "are able to 'guess' reliably about certain features of the stimulus, features having to do with motion, location, direction"[123], allowing them to discriminate certain forms without having an A-conscious representation of the stimulus. We will first present Block's explanation of the phenomenon, then our hypothesis of how we think this process occurs.

1. The Specialized Module Route

The explanation Block provides is that the specialized module responsible for processing the stimuli "has some information about the verticality of the stimulus"[124], or, as Zeki would put it, has already processed the stimulus. Block maintains that, in the case of a blindsight patient,

> The pathways between this specialized module and the phenomenal consciousness system have been damaged, creating the 'blind field,' so the patient has no phenomenally conscious experience of the line, and hence his Executive System has no information about whether the line is vertical or horizontal. But *the specialized module has a direct connection to the Response System*, so when the subject is given a binary choice, the specialized module can somehow directly affect the response.[125,126]

[123] Block, "On a Confusion," 160.
[124] Block, "On a Confusion," 165.
[125] Block, "On a Confusion," 165. [emphasis added]
[126] Note here the connections Block is making: the specialized module (the area of processing on Zeki's theory) has direct connection to both a response system (that system which is responsible for communication in the case of the blindsight patient) and phenomenal consciousness (that is the totality of experience, which would equate to post-binding on Zeki's theory). Two things are worth noting here: 1) Block maintains that the explanation he gives is

Notice here how Block contradicts his own condition of information traveling from the specialized module to P-consciousness and then to A-consciousness. Instead, he proposes here that information which is sufficient for recognition but are not available for the free use of reasoning can yet directly affect behavior, by traveling directly to the response system, bypassing both P- and A-consciousness. Thus, he argues, "when a representation is not conscious—as in the blindsight patient's blindfield perceptual representations—*it can influence behavior* behind the scenes, but only when the representation is conscious *does it play a rational role*."[127].

However, there is an issue with Block's proposal of taking the route of the specialized module as being able to "somehow" affect the response of the blindsight patient. That issue is coming from Block himself, whom we quoted earlier as saying that "[i]n the case of language-using organisms such as ourselves, a major symptom of access-consciousness would be *reportability*" [128] . If reportability is a major symptom of access-consciousness, how can reportability, at the same time, be considered as mere behavior and not a rational response? How can voluntary speech, which is the most elaborate manifestation of A-conscious rationality, come under the control of a single specialized module? Even more puzzling, would any specialized module be able to take control over any response system at any moment? What if two specialized modules are sending urgent contradictory information at the same time? Shouldn't P-consciousness act as a moderator, since already one of its functions is "integrating the outputs of the specialized modules"?

"highly speculative" – Block, "On a Confusion," 166, and 2) In what seems to be an endorsement of this explanation, Block later maintains, in the same article, that "[i]n blindsight, both A-consciousness and P-consciousness (I assume) are gone, just as in normal perception, both are present. So blindsight is yet another case in which P-consciousness and A-consciousness are both present or both absent". – Block, "On a Confusion," 194. We decided to take on Block's explanation based on this later endorsement.

[127] Block, "On a Confusion," 160. [emphasis added]

[128] Ned Block. "What Is Dennett's Theory a Theory Of?," in C*onsciousness, Function, and Representation: Collected Papers* (Cambridge: MIT Press, 2007): 144

Hypothetically, for this to be correct, this would need a case where there is an observable effect of a specific specialized module over a specific splanchnic nerve, leading to a specific bodily reaction. And even then, P-consciousness would need to act as the link and regulator between different information coming from different specialized modules and the responses to trigger. Surely, the specialized modules can have a say regarding the *urgency* of a certain stimulus—think of a ball hurling towards your face—yet it would still require binding in order for the information to be integrated to make sure other modules are not reporting a more urgent stimulus – say reporting pain from your foot caught on fire.

The questions do not stop here[129], despite the fact that this method is clearly highly speculative. Nevertheless, in order to do justice to Block's view, let us look at an argument that can be in favor of what he presents. Consider Wernicke's speech aphasia, where

> language output is fluent – that is, normal in mean phrase length, generally sentence-length, and using all grammatical elements available in the language. Content may be extremely paraphasic or empty. Paraphasic speech conforms to the general rules of the language but contains substitutions at the phonemic level (phonemic paraphasias such as *smoon* for *spoon*), the word level (semantic paraphasias such as *cup* for *spoon*), or entirely novel but phonologically legal words (neologisms such as *snopel*)[130].

This type of aphasia is associated with damage to the superior temporal gyrus with more severe effects if the damage extends to middle and interior temporal gyri[131]. Wernicke's aphasia requires damage to all three regions specifically because, despite the fact that cross-modal semantic

[129] Another reason why this route is questionable is the nature of the operation of guessing itself. If guessing between two options involves the elimination of one of them, then there needs to be some sort of verification mechanism involved in that elimination. If phenomenal content acts as this verification mechanism, whereby, if the phenomenal concept processed does not correlate with the phenomenal content of the perceptual experience the subject becomes aware that this perceptual experience is a hallucination, then this begs the question: what would be the elimination mechanism involved in the correct guessing of the blindsight patients? One more reason to question this route is: if we consider the sympathetic nervous system's response to external stimuli the standard for what a response system should be, meaning that response systems have to be involuntary, how could we consider the production of conscious speech to fall under the same umbrella of involuntary activity without claiming that we have no ability to reason?

[130] Michael P. Alexander, "Aphasia I: Clinical and Anatomical Issues," *Patient-based Approaches to Cognitive Neuroscience* (Cambridge: MIT Press, 2000): 184.

[131] Alexander, "Aphasia I," 185.

knowledge emerges from multiple regions in the posterior association cortex, "available evidence highlights the inferior temporal and middle temporal/angular gyrus transition as the particularly key regions for word retrieval".[132]

The reason we are bringing up Wernicke's aphasia here is that this is a case where the speech (response) module which is responsible for semantic formulation is having trouble translating the orders from the executive system into produced speech. This type of aphasia is not associated with cognitive issues on the level of formulating ideas, but only on the level of producing the correct counterparts to these ideas in semantic form. This means that, in this case, the executive system does not have total authority over speech production, allowing for the speech module *itself* to determine the content of the speech produced (albeit still relatively similar to that dictated by the executive system). On these lines, one could argue that in the case of the blindsight patient being shown a vertical line, the executive system, albeit without physical damage to the temporal gyrus, could, in theory, delegate the responsibility of the response to the response module, which turns to the specialized module responsible for processing shapes to arrive at the correct answer regarding whether the line is horizontal or vertical. This, however, will need to entail the assumption that speech itself can be understood as part of the involuntary response system of the body. There can be an argument for that, given that in thinking what we speak, we do not stop to think about the language we speak it through. A counter view to that would be based on the understanding that language takes advantage of the multimodality of the sensory-motor system, states that there exists "no single 'module' for language—and that human language makes use of mechanisms also present in nonhuman primates"[133].

[132] Alexander, "Aphasia I," 185.
[133] Vittorio Gallese and George Lakoff. "The Brain's Concepts: The Role of The Sensory-Motor System in Conceptual Knowledge." *Cognitive neuropsychology* 22, no. 3-4 (2005): 456.

Our aim here is not to outright argue against Block's vision, especially since we believe it can work in certain cases. Yet we find it unconvincing in answering the question: how could there be accurate reporting on a specific feature of a stimulus which cannot be seen? Block offers little more than claiming that "the specialized module can *somehow* directly affect the response" [134]. What we want to provide here is an alternative route that shows how information in the specialized module can affect rational behavior without registering a phenomenal character at all, essentially arguing for the existence of phenomenal concepts. We now turn to the second route.

2. The Phenomenal Concept Route

Our proposed argument for the nature of the operation by which blindsight patients are able to successfully guess simple facts regarding stimuli will depend on the truth of three premises. We will proceed by presenting the evidence we have for the truth of each of the premises, followed by our conclusion.

o Premise 1: The Nature of Concepts

In their book *Philosophy in the Flesh*, George Lakoff and Mark Johnson operate within the parameters of the understanding that reasoning by means of concepts requires that "the neural structures of the brain carry out that reasoning"[135]. On their understanding of embodiment, "the same neural system engaged in perception (or in bodily movement) plays a central role in conception"[136,137]. They propose what they call "primary metaphors" as the vehicles of mental

[134] Block, "On a Confusion," 165. [emphasis added]
[135] George Lakoff and Mark Johnson, *Philosophy in the Flesh*. (New York: Basic books, 1999), 64, E-Book.
[136] Lakoff and Johnson, "Philosophy," 132, E-Book
[137] It is important to note that the proof Lakoff and Johnson have of their theory is one of possibility and not of actuality. Meaning that they do not have "any strong neurophysiological evidence, say from PET scan or functional MRI results, that the same neural mechanisms used in perception and movement are also used in abstract reasoning". – Lakoff and Johnson, "Philosophy," 133, E-Book. However, in the absence of a neurophysiological proof, clinical neuropsychology and cognitive neuroscience have been able to step in and provide sound arguments. The first established an existing relationship between "given patterns of localised brain damage and corresponding deficits in conceptual knowledge", and the second identified "which brain regions are activated by different conceptual categories" through brain imaging experiments. – Gallese and Lakoff, "The Brain's Concepts," 457. The problem here

representations used for thinking. A primary metaphor "allows conventional mental imagery from sensorimotor domains to be used for domains of subjective experience", such as when we conceive that failure to understand something can be associated with it flying over our heads, or that "prices rose" is understood in the same manner as "more is up" which is "a subjective judgment of quantity [that] is conceptualized in terms of the sensorimotor experience of verticality"[138]. Christopher Johnson hypothesizes that, in early development, the concepts of verticality and quantity are *conflated* with one another. Later on, the concepts are separated, yet are connected by "a cross-domain mapping between the sensorimotor concept of verticality (the source domain) and the subjective judgment of quantity"[139].

Christopher Johnson studied the utterances recorded over the course of the language development of a child named Shem. In his analysis, Johnson attempted to determine the exact point at which Shem became able to use "I see what you're saying" as a metaphoric representation of "I understand what you mean"; where "[s]eeing is the metaphorical source domain used to conceptualize knowledge, but it is not used literally"[140]. The interesting part is that, before Shem was able to use this metaphor, he entered a stage of conflation between the two concepts, where knowing and seeing domains were confused with one another. This conflation allows for the cultivation of a primary metaphor where, after the period of conflation is over, the child would be capable of differentiating between the two concepts. Conflations, Lakoff and Johnson argue, "are instances of coactivation of both domains, during which permanent neural connections between the domains develop"[141].

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is, and why these two statements sound like they're contradicting one another, is that "to date no such convincing solution has been proposed" regarding which of the number of theories explaining the *extent* of conceptual knowledge structure dependent on sensorimotor systems. – Gallese and Lakoff, "The Brain's Concepts," 457.

[138] Lakoff and Johnson, "Philosophy," 159, E-Book

[139] Lakoff and Johnson, "Philosophy," 160, E-Book.

[140] Lakoff and Johnson, "Philosophy," 161, E-Book

[141] Lakoff and Johnson, "Philosophy," 163, E-Book

Christopher Johnson's work paved the way for Joseph Grady's theory of primary metaphors which tried to explain how subjective judgment is based on sensorimotor domains. Lakoff and Johnson describe primary metaphors as "an atomic component of the molecular structure of complex metaphors"[142], and they stress that they are "not the result of a conscious multistage process of interpretation. Rather it is a matter of immediate conceptual mapping via neural connections"[143]. One example of a primary metaphor is "Similarity Is Closeness", where the subjective judgment "similarity" is tied to the sensorimotor domain "closeness" where the primary experience involved in both is observing how similar things are clustered together, such as flowers or trees. What this means is that the perceptual neural structure which is involved in observing the closeness of things is the same one responsible for discerning that these close things, more often than not, are similar. To put it simply, the ability to think a concept such as grasping, "makes use of the same neural substrate as performing and perceiving *grasping*"[144], and the ability to think a concept such as similarity involves the same neural substrate as perceiving closeness. In other words, conception piggybacks on perception[145].

What this essentially means is that: a) at least in their early stages of formation, concepts are interlinked to phenomenal characters (such as intimacy correlating with proximity), and b) that concepts depend on their formation on sensorimotor and perceptual systems (the concept grasping making use of same neural substrate as performing and perceiving grasping). This is significant because: a) it opens up the possibility that a phenomenal character can be identified as the source of a concept or a number of concepts, and b) that in thinking with these concepts, the same neural substrata of experiencing this phenomenal character is involved as well. If we take these two ideas

[142] Lakoff and Johnson, "Philosophy," 164, E-Book
[143] Lakoff and Johnson, "Philosophy," 180, E-Book
[144] Gallese and Lakoff, "The Brain's Concepts," 456
[145] Lakoff and Johnson, "Philosophy," 78, E-Book.

and apply them to the case of blindsight patients being presented with a vertical line, then since the perceptual system of the patient is capable of discriminating the shape it sees and sending the information down to P-consciousness (a condition argued for by Zeki's micro-consciousness theory), and if this entails firing the same neural path as the ones involved in symbolic concepts which are part of A-consciousness, then the executive system can determine the *range of possibilities* involved in firing this particular neural path and then make a guess based on it, all without the information registering in P-consciousness. What we're saying is that since the neural structure of concepts as we think of them in A-consciousness converges with the neural structure of phenomenal experience from sensorimotor and perceptual systems, then the activation of the latter should entail an activation of the first. The difference in the blindsight patient is the absence of a phenomenal character which, in the case of normal population, would act as a *verification tool* to decisively determine which of the range of possibilities is the correct one, i.e. how a specific stimulus *usually* used to appear to the subject. This would be the reason why the blindsight patient is able to *guess* but not *know* whether the line is horizontal or vertical. We still argue that the phenomenal character of a perceptual experience is as important as the phenomenal concept generated by that perceptual experience. Neither of them alone can accurately determine what is it the subject is perceiving. The coupling of discrimination of the phenomenal concept and the experience of the phenomenal character is what guarantees the validity of perception.

- **Premise 2: Perceptual Discrimination**

This premise is a further elaboration on Zeki's thesis of micro-consciousness to highlight two things: the hierarchical nature of processing certain features of stimuli, and the uncoupling of awareness and discrimination as two distinct capacities. Take the processing of the full experience of color in three distinct cortical stages, each with its own function. The first two stages, in V1/V2

and V4, represent the computational aspect of color perception, and are concerned with the registration and the comparative processing of color, respectively[146]. The third stage, beyond V4, is concerned more "not with computing colours in an abstract sense, but with object and surface colours"[147]. Accordingly, the processing of color, in the model of Zeki and Marini, reconsolidated both computational theories of color processing with cognitive ones that depended on memory and object recognition. But most importantly for our purposes, it showed that the profiling of color itself does not need processing beyond V4 before it is successful; i.e. discrimination of color does not require more complex processing, while connecting the color with the object/surface requires further processing elsewhere in the brain.

Similarly, the discrimination of certain features of stimuli does not require further hierarchical processing. For example, Zeki and Ffytche were able to demonstrate that activation in area V5, which is critical for perception of visual motion, in a blindsight patient, despite the patient suffering from legions in V1 area, correlated with the patient's ability to discriminate the type of motion (fast or slow) involved in the presented stimulus. In other words, activation of V5 "elicit[s] a conscious *discrimination*"[148] in the blindsight patient, without necessarily being *aware* of the stimulus in play[149]. This suggested that the coupling of awareness, understood as reporting a

[146] The first stage involving V1 and possibly V2, is "concerned mainly with registering the presence and intensity of different wavelengths, and with wavelength differencing". – Zeki and Marini, "Three Cortical Stages," 1669. The second stage, involving V4, performs two processes: "One process would consist of generating a lightness at a given waveband for a given surface in the field of view, by comparing the intensity of light reflected from that surface with the intensity of the same light reflected from other surfaces. The second comparison would be to compare the lightness of a patch produced by at least two different wavebands, the comparison of comparisons leading to colour." – Zeki and Marini, "Three Cortical Stages," 1680.

[147] Semir Zeki and Ludovica Marini. "Three Cortical Stages of Colour Processing in The Human Brain." *Brain: a journal of neurology* 121, no. 9 (1998): 1680.

[148] Semir Zeki and Dominic H. Ffytche. "The Riddoch Syndrome: Insights into The Neurobiology of Conscious Vision." *Brain: a journal of neurology* 121, no. 1 (1998): 42.

[149] Zeki and ffytche reported that their patient's "awareness for a given task varied between 0 and 80% on different occasions while his discrimination level remained unchanged". However, they also asserted that the patient's "discriminatory performance can vary for the same task, without necessarily entailing a parallel fluctuation in awareness". Zeki and ffytche hypothesized that this uncoupling between awareness and discrimination is caused by

perceptual experience, and discrimination, understood as identifying features of presented stimulus, in normal population is actually two distinct processes occurring simultaneously, and that the uncoupling which happens in the case of blindsight is what allowed us to realize the difference between the capacity for awareness and ability for discrimination. This suggested that blindsight patients' ability to discriminate is not unconscious, like Block claimed, but rather is "conscious, yet severely degraded vision"[150]. By extending the same logic to the normal population, we can claim that discrimination itself, which correlates to activation of particular visual areas in the brain, is a form of degraded conscious vision.

Accordingly, if, in the case of the vertical line, the capacity of the blindsight patient to discriminate whether the line is horizontal or vertical correlates to specific activation of certain areas associated with detecting spatial orientation, then we can push for the claim that as long as the visual information can reach the appropriate specialized module, then information regarding the orientation should be available regardless of whether or not that information registers as phenomenal character. Interestingly, research has shown that "human visual sensitivity and acuity is typically better at horizontal and vertical orientations than at oblique orientations"[151]. Furmanski and Engel demonstrated that orientation-specific signals arise early in visual processing, where an asymmetry has been observed in "the responses of human primary visual cortex (V1) to oriented stimuli"[152]; specifically, that "V1 produces a larger response to cardinal stimuli than to oblique stimuli"[153]. These results proposed the possibility that "distinct populations of neurons within a

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the V1 lesion, "perhaps by increasing the overall level of background neural noise in [the patient's] spared pathways", although they affirm that there's no direct evidence of this. – Zeki and ffytche, "The Riddoch Syndrome," 40-41.

[150] Morten Overgaard, Katrin Fehl, Kim Mouridsen, Bo Bergholt, and Axel Cleeremans. "Seeing Without Seeing? Degraded Conscious Vision in a Blindsight Patient." *PloS one* 3, no. 8 (2008): 1.

[151] Bruce C. Hansen and Edward A. Essock. "A Horizontal Bias in Human Visual Processing of Orientation and Its Correspondence to The Structural Components of Natural Scenes." *Journal of vision* 4, no. 12 (2004): 1045.

[152] Christopher S. Furmanski and Stephen A. Engel. "An Oblique Effect in Human Primary Visual Cortex." *Nature neuroscience* 3, no. 6 (2000): 535.

[153] Furmanski and Engel, "An Oblique Effect," 536.

cortical area can be isolated and functionally linked to perception"[154,155]. If we suppose that the lesions in V1 in the case of the blindsight patient do not affect the particular groups of neurons that are sensitive towards cardinal rather than oblique orientation, and if these groups of neurons share a capacity for discrimination similar to that in the case of V5 and motion, then that already gives us a neural basis for how the specialized modules of blindsight patients are capable of *consciously* [156] discriminating between horizontal and vertical lines without the need for hierarchical processing, since the question they're asked is specifically about a single feature which has been processed accurately.

We felt it important to reiterate here that this thesis is in no way endorsing this model as something which can be generalized. All we are attempting to present is a case where a phenomenal concept features in rational thinking without the accompanying phenomenal character as a way of arguing that it does exist as its own class of concepts. What is left now is to answer *how* exactly can the executive system guess certain aspects of a stimulus that has been processed

[154] Furmanski and Engel, "An Oblique Effect," 536.

[155] Notice how this *oblique effect* is different from the *horizontal effect*. The first indicates that "sensitivity for simple stimuli is widely reported to be superior at horizontal and vertical orientations and worst at oblique orientations", while the latter indicates that "visual sensitivity is best at oblique orientations, worst at horizontal, and intermediate at vertical" in the case of broad-band naturalistic stimuli. – Hansen and Essock, "A Horizontal Bias," 1045. Meaning that, within a natural setting, the visual system shifts the priority from detecting cardinal stimuli to oblique ones. This is believed to have evolutionary advantages since "the content contained in typical [natural] scenes was found to exhibit a horizontal bias", and thus "a mechanism that turns down sensitivity for the expected content in a typical scene would serve to relatively enhance the salience of unexpected or novel content at off-horizontal orientations". – Hansen and Essock, "A Horizontal Bias," 1055.

[156] Just to recap, Block argues: "I don't mean to say that the blindsight patient is irrational.) The idea is that when a representation is not conscious—as in the blindsight patient's blindfield perceptual representations—it can influence behavior behind the scenes, but only when the representation is conscious does it play a rational role; and so consciousness must be involved in promoting this rational role." – Block, "On a Confusion," 160. Our argument shows that when *guessing* the right orientation and *reporting* on it, the blindsight patient is not engaged in any unconscious operation, but rather a conscious rational determination. The reason Block makes this argument is that he sees no way for information to travel from the specialized modules *directly* to the executive system. We took issue with how he explains reporting, which is a clear sign of A-consciousness, in terms of a specialized module taking over direct control – as if this reporting could fall under the control of the Autonomic nervous system. Our argument presented a possible way for the executive system to trace the set of possible information from a given neural trace and make an educated guess about certain features of a stimulus.

and discriminated by certain brain regions without the information passing through a phenomenal consciousness?

- **Premise 3: The Nature of Representation (Neural Tracing)**

If we look at the previous question with respect to the full argument we are developing, we can say that since what is in play in the case of a blindsight patient is a form of a "severely degraded vision", than what is being produced is also a form of a severely degraded representation. If we take a representation to involve a perceptual experience, a correlated phenomenal experience, and an instantiated phenomenal concept, and if we consider the capacity of the blindsight patient to guess that the line is vertical as a successful diminished representation, then we need to ask how it is possible for a representation to only involve a phenomenal concept, without phenomenal content.[157]

In his discussion of the relationship between memory and representation, Norman Malcolm argues against the idea that, what is involved in recalling a memory is "an image, copy, picture, pattern or representation"[158]. Instead, he argued for what he described as neural trace, stating that:

> You have an experience. The experience itself cannot survive the passage of time; but the structure of the experience can be stored in the brain. The neural mechanism that performs this function is the trace. As long as the trace persists you have a "dispositional" memory of the experience. The experience is "coded" into the trace. If one knew the code […] one could "read off" an experience from its trace. When the trace is subjected to the right sort of stimulus an "occurrent" memory results, which contains an active representation of the original experience.[159]

[157] It is important to note that the literature on blindsight patients refers to two types of patients: Type I have "discrimination capability in the total absence of any acknowledged awareness", while Type II "have some 'feeling' of the occurrence of an event without seeing per se". What we are presupposing in this argument is a type I blindsight patient. – Arash Sahraie, Paul B. Hibbard, Ceri T. Trevethan, Kay L. Ritchie, and Lawrence Weiskrantz. "Consciousness of The First Order in Blindsight." P*roceedings of the National Academy of Sciences* 107, no. 49 (2010): 21217.

[158] Norman Malcolm. "Memory and representation." *Nous* (1970): 69.

[159] Norman Malcolm. "Memory and representation." *Nous* (1970): 69.

What this means is that as long as there is a capacity for this neural trace, the information should be relayed to whichever part of the brain *traced* this information. Consider the following story in the case of a blindsight patient: The executive system has seen many cardinal shapes in its day. It has marked the neural path the signal takes in travelling from the specialized module to phenomenal binding[160]. Once that path is triggered again, the executive system can make a guess as to which of the two most likely answers is the correct one. Whether this happens based on a specific sequence of firing or the involvement of a specific set of neurons is ambiguous at this point. What is unambiguous is that so long as the neural path is activated, a diminished representation can be traced by the executive system A-consciously.

Much like in the case of uncoupling discrimination from awareness, where the information necessary for discriminating a stimulus does not require the subject to be aware of it, a case of uncoupling the relationship between A-consciousness and P-consciousness can be argued, where the information needed to report on a stimulus can be traced by A-consciousness without the verification of phenomenal character.

What adds support to this understanding is that, given Lakoff and Johnson's theory of primary metaphor, which argues that the neural substrata of sensorimotor domains allow for the conventional mental imagery "to be used for domains of subjective experience", then one can argue that as long as these neural substrata are activated, the executive system should notice this activation. It would certainly be an odd experience for the executive system, and the subject as well, to have information which they are unable to connect with specific phenomenal character, but we can conceive of the phenomenal character which accompanies a situation like this to be one of puzzlement. The case, then, for the blindsight patient, and what sets them apart from normal

[160] We use phenomenal binding to signal to the moment of conversion from information to phenomenal experience.

population, is that the neural trace in their perception involves triggering mechanisms that are only specifically designed to *think* about the associated concepts, i.e. the executive system, and not those which are equipped with triggering the accompanying phenomenal character, i.e. phenomenal binding. In other words, it is a case of *conscious uncoupling*.

To demonstrate this idea of representations as neural tracing, consider for instance the patients with damage to their hippocampi. One of the more famous patients, referred to in the literature as KC, and earlier as NN, provided the following introspection to Endel Tulving in 1985 who was following up with him at the time. KC states that asking him to envision his future is "like being in a room with nothing there and having a guy tell you to go find a chair, and there's nothing there", and in another occasion, as "swimming in the middle of a lake. There's nothing there to hold you up or do anything with" [161]. Tulving hypothesized that "recollection and episodic future thought are two sides of the same core cognitive capacity, which he termed 'autonoetic (self-knowing) consciousness'"[162]. This means that, despite understanding the concept of future, the patient was unable to fulfill the content which falls under that concept in their everyday life; as if the concepts turned into an empty set. As if, to be more imaginative, the lever inside the executive system which is responsible for triggering the neural trace that allowed for the realization of the concept "future" and its application to a set of data still exist, albeit without the wiring which allows for such neural tracing to take place, which in turn did not allow for a representation to be possible.

- *Conclusion:*

Based on our premises, we can argue that

[161] Kathleen B. McDermott, Karl K. Szpunar, and Kathleen M. Arnold. "Similarities in Episodic Future Thought and Remembering: The Importance of Contextual Setting." *Predictions in the brain: Using our past to prepare for the future* (Oxford: Oxford University Press, 2011), 84.
[162] McDermott, et. al., "Similarities in Episodic Future," 84.

P1. If symbolic concepts are built up on sensorimotor and perceptual systems, meaning they're the product of a process of symbolic encoding from their original form as phenomenal concepts

P2. *If* specific areas in the brain are capable of discriminating stimuli without necessarily being aware of them, meaning that the processing of a stimuli is enough to trigger the concept associated with it without necessarily having a phenomenal content attached to it

P3. *If* representations are processes of neural tracing,

C. *then* the blindsight patient's executive system does have a representation of the phenomenal concept, albeit diminished and uncorroborated by phenomenal character, which is produced by processing the stimulus in the specialized module; a representation which is possible through tracing which neural path is active during the perceptually-positive/phenomenally-negative experience of the stimulus. This means that what the executive system really lacks in the case of blindsight is *phenomenal content as a verification tool*[163] – which pushes the executive system to *guess* by eliminating one of the two possibilities it is presented with, based on previous experience. The question to be tackled now concerns the extent of *control* phenomenal concepts can have over behavior, precisely in cases of diminished A-consciousness.

Section III: The Behavioral Question

- The purpose of this section is to argue that <u>phenomenal concepts can affect behavior</u> in the case of an absent/diminished A-consciousness.

[163] This idea of phenomenal content as a verification tool can be used to argue for why hallucination do not *seem* to be real despite their engagement with the same neural paths used during perception. Perhaps all there is for a someone realizing he is hallucinating a dagger floating in the air is that the phenomenal character of the experience *seems* odd when coupled with the phenomenal concept.

In a 1995 experiment, a group of researchers lead by Sarah Boysen, offered chimps two trays of candy; one with a lesser number of candy than the other. In order to choose, the chimp has to point at one of the trays. The catch, however, is that the chimp then gets the other tray and not the one it chose. In Boysen's lab, chimps "seem unable to learn to make the optimal choice here, despite hundreds of trials"[164]; they tended to choose the tray with the more candy. Godfrey-Smith refers to this as the "candy-versus-candy ("c/c") condition"[165].

Having learned Arabic numerals in other experiments, the chimps were then presented with the problem again – this time with numerals instead of candy. The chimps tended to perform well in this task almost immediately. One explanation for that, as Godfrey-Smith elaborated following Boysen, is that a "basic or primitive perception–action mechanism is interfering with information processing. The use of symbols frees the chimp from the constraints of this primitive mechanism, and the chimp can then exercise the right choice."[166].

In the first follow up, instead of the candy/candy condition, the group introduced a rock/rock condition to test whether "the intrinsic desirability of the candies that is causing the trouble, or are there deeper differences between thinking in terms of concrete objects and thinking in terms of symbols?"[167]. The chimps "did almost as badly with the rock/rock condition as they did with the c/c one"[168] which ruled out this possibility. In the second follow up, the group used mixed pairs of trays, candy/numeral, and found that the chimps treated the this more like numeral/numeral and not like candy/candy. Godfrey-Smith notes that "[t]he presence of one numeral was enough to get them on track to make the right choice"[169]. The results suggest that the

[164] Peter Godfrey-Smith. "Untangling The Evolution of Mental Representation." In *Evolution, Rationality and Cognition*, ed. António Zilhão (Routledge, 2006.), 4.
[165] Godfrey-Smith, "Untangling," 94.
[166] Godfrey-Smith, "Untangling," 94.
[167] Godfrey-Smith, "Untangling," 95.
[168] Godfrey-Smith, "Untangling," 95.
[169] Godfrey-Smith, "Untangling," 95.

chimps are engaged in "a different kind of processing" in dealing with numerals than when they are dealing with objects, as the symbolic representation of the problem "makes possible more flexible, information-driven, and decision-theoretically rational behavior"[170].

A similar situation of this sort of automatic behavior can be seen in epileptics with seizure during performing mundane tasks. It is observed that they "continue their activities in a routinized, mechanical way despite, [as John Searle argues], a total lack of consciousness"[171]. Block goes into a lengthy discussion disputing the claim that there is a lack of consciousness *per se*[172]. What he argues is that what is lacking in the epileptics is A-consciousness and not P-consciousness. He asks, in the case of a walking epileptic,

> Doesn't he see the obstacles he avoids? Suppose he gets home by turning right at a red wall. Isn't there something it is like for him to see the red wall—and isn't it different from what it is like for him to see a green wall? Searle gives no reason to think the answer is no. Because of the very inflexibility and lack of creativity of the behavior they exhibit, it is the *thought processes* of these patients (including A-consciousness) that are most obviously deficient; no reason at all is given to think that their P-conscious states lack vivacity or intensity.[173]

Block then likens the case of a walking epileptic to that of a distracted driver. He argues that in both cases, there is no reason to claim that P-consciousness is absent, but there is some reason to think that "perhaps his A-consciousness of what he sees is diminished. (Of course, it can't be totally gone or the car would crash.)"[174]. This idea of a diminished A-consciousness can be understood in terms of habits. Anyone who took on a semi-mechanical job can relate to how, in certain times when one is busy thinking of something else, the person might lack distinct memory of the tasks performed, yet evidence would suggest they have been performed well enough.

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[170] Godfrey-Smith, "Untangling," 95.
[171] Block, "On a Confusion," 160.
[172] Block, "On a Confusion", pp. 187-195
[173] Block, "On a Confusion," 188.
[174] Block, "On a Confusion," 191.

What is common between the three cases of the chimps, the walking epileptic and the distracted driver is that they lack creativity and voluntary decision making (ignoring the cognitive differences between the subjects in three cases, of course). What they tell us is an ability from the side of P-consciousness to step up and take over behavior, either radically in the case of the chimps, or in a manner in line with delegations in the cases of the walking epileptic and the distracted driver. The question here is, can P-consciousness take control over rational behavior even in cases where A-consciousness is not diminished? We can already observe this happening on two occasions: *reflexes* and *diverting attention*. If a person sees a ball hurling towards him, the person will move his hand to fend his face without freely deciding to do so. There is no "conscious decision" to lift his arm to fend off the ball. In the case of attention, consider how it can be directed both intentionally and unintentionally:

> Top-down influences are based on the observer's "internal" experience, much concerned with one's intention, constituted by past experiences and expectations over that context and scenario. Bottom-up influences, on the other hand, are based on facts that are external to the observer, mainly built from stimulus salience which, by its turn, *represents the degree of attracting one's attention based on basic features from the visual map*. In another way to put it, top-down (endogenous attentional control) is what you expect and bottom-up (exogenous attentional control) *is the summation of basic physical characteristics of items in a visual display*. Consequently, visual attention can be voluntarily directed to goal-driven purposes, such as looking for something you lost at a public place, however remaining open to random salient stimuli, like a flash of light.[175]

This opens up an interesting feature of specialized modules processing of features of stimuli, which is the *urgency value* a specialized module would assign to information about a stimulus, and how the "summation of basic physical characteristics of items in a visual display", or phenomenal binding as we would call it, takes into consideration these assigned values when making the decision to either maintain the decision of the executive system to continue focusing on goal-

[175] Eduardo Sturzeneker Trés and Sonia Maria Dozzi Brucki. "Visuospatial Processing: A Review from Basic to Current Concepts." *Dementia & neuropsychologia* 8, no. 2 (2014): 179.

driven purposes, or to override the decision of the executive system and divert attention towards a specific stimulus which was deemed urgent by the specialized module.[176]

If we take this understanding and apply it to such a highly contested case as the distracted driver, we find that the debate has been centered around the wrong questions. While Michael Tye argues for the possibility of a distracted driver since he accepts first-order representation, and Wayne Wright argues against that possibility through what he calls "higher-order attention theory", both philosophers fail to tell is anything about the *urgency value* of the stimuli surrounding the distracted driver. Compare a driver who has been driving one the same dusty slim empty road between his house and his work for the past 10 years to another driver who has only been driving for 10 days and is getting on the freeway. Naturally, the first driver can afford to be distracted since his diminished sense of A-consciousness about his surroundings, his habitual behavior, can take over and deliver him to his destination without much intervention from a more elaborate A-consciousness given how no creativity is required to perform that task. On the contrary, the driver on the freeway cannot afford to get distracted or else he will most certainly crash. Both Tye and Wright are correct in regarding the distracted driver, but both are inadequately representing the whole spectrum of possibilities regarding which level of representation is required to perform the task under specific circumstances.

[176] To elaborate more on this idea of *urgency value*, consider the following example: you walk into your office and everything is where it is supposed to be. The urgency value assigned to your perceptual experience is zero. You feel whatever feelings normally associated with your office. The next day, you enter your office. Your wife has added a new lamp to your disk. You do not notice the lamp immediately since it is not lit, and it is set up in a non-invasive way. This is an urgency value of level 1. The next day, you enter your office. There are now 5 lit lamps on your disk. You notice the lamps immediately and you *think* to yourself what is going on here? You switch the lamps off and you go about your business. This is an urgency value of 2. The urgency value assigned by your specialized modules to the items of your environment depends on how odd the items seem to be according to your expectations of what occupies the environment.

Chapter III: Neurophilosophy and Epistemology Naturalized

We have now argued our case that thought always involves phenomenal concepts. We reckon it is important here to note that what we have argued is not some form of behavioral determinism, whereby a certain phenomenal concept entails a necessary behavioral outcome—far from it. What we argued is simply that upon coming in contact with a stimulus, the content of a phenomenal concept *necessarily becomes available for the free use of reasoning* for the experiencing subject. The *necessity condition* we are arguing is between stimulus *s* and phenomenal concept *c*, and not between phenomenal concept *c* and behavior *b*. What the subject does with *c* is a matter of reasoning, except perhaps in cases of reflexes. What's next is to survey the philosophical theoretical space in order to ground our thesis within established doctrines. We will begin by discussing the concept and methodology of neurophilosophy, followed by a survey of theories of consciousness, then a survey of theories of perception, and ending with a discussion of the concept of epistemology naturalized. What our thesis aligns itself with is Block's Biological theory of consciousness, Phenomenalism, and two-factor semantics. Our liberal use of the word "survey" is prompted by our method of highlighting the relevant parts of a favorable theoretical landmark by contrasting it with neighboring contesting ideas. We ask the reader to proceed with the understanding that the limited space we have does not allow to fully dive into each of the theoretical landmark, but only to present how our work relates to it.

Prologue: Neurophislosophy

Just as the name suggests, neurophilosophy is concerned with measuring up our philosophical theories of the mind to our understanding of the neurology of the brain. It presupposes a type of

mind-brain correlation[177], i.e. "correlations between mental phenomena and neural states of the brain"[178]. A formulation of the mind-brain thesis can be seen as follows:

> For each type M of mental event that occurs to an organism *o*, there exists a brain state of kind B (M's "neural correlate" or "substrate") such that M occurs to *o* at time *t* if and only if B occurs to *o* at *t*.[179,180]

However, the study of neurophilosophy is not only restricted to the neurology of the brain. In the introduction to her book "Neurophilosophy," Patricia Churchland explains that

> The sustaining conviction of this book is that top-down strategies (as characteristic of philosophy, cognitive psychology, and artificial intelligence research) and bottom-up strategies (as characteristic of the neurosciences) for solving the mysteries of mind-brain function should not be pursued in icy isolation from one another. What is envisaged instead is a rich interanimation between the two, which can be expected to provoke a fruitful co-evolution of theories, models, and methods, where each informs, corrects, and inspires the other.[181]

Thus, we can say that our methodology in this thesis has been in line with Patricia Churchland's understanding of how an investigation into neurophilosophy should be carried on: we have used experiments from behavioral psychology in conjunction with our neural understanding of the nature of hallucinations to argue for the outwardly nature of consciousness[182]. We have also

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[177] Regarding the mind-brain identity thesis, we need to make our position clear: Phenomenal mental events (P-type) are different from Access mental events (A-type). And so, for all mental events of the P-type, the occurrence of mental event *p* of the P-type necessarily means being in biological B-type *b* because p = b, since all P-types = some B-type. The same does not apply for Access mental events since we do not know how specific cognitive types correlate to physical states. In other words, we endorse a stronger *identity thesis* for P-type events and a weaker *correlation thesis* for A-type events. We believe that lumping together all mental events as one type, as often done in the literature, misses the point of the distinction between A/P consciousness. Note that this applies only to biological beings. Any argument regarding artificial intelligence falls outside the scope of this thesis.

[178] Jaegwon Kim, "Mind as the Brain: The Psychoneural Identity Theory" in *Philosophy of mind* (Routledge, 2018), 91.

[179] Kim, "Mind as the Brain," 92.

[180] It is important to note that this does not necessarily entail a one to one correlation. Kim maintains that "[i]t is plausible that everything that occurs in mental life has a state of the brain (or the central nervous system) as its *proximate* physical basis." – Kim, Mind, 93. The emphasis on proximate is Kim's.

[181] Patricia Smith Churchland. "General Introduction," in *Neurophilosophy: Toward a unified science of the mind-brain*. (MIT press, 1989), 3.

[182] Just to remind the reader, in the introduction we stated that "we rather argue that since the nature of consciousness itself is outwardly, which means that it is constantly seeking stimuli, then thinking is also outwardly in nature. That is to say, not only do stimuli necessarily feature into our thinking, but they make it possible in the first place." Basically,

considered the neural basis of perception in conjunction with cognitive theories of concept formation to come to an understanding of the nature of phenomenal concepts.

Neurophilosophy also presupposes, on the conception of Churchland, a type of naturalized epistemology whereby they both reject the idea of a first philosophy in favor of an understanding of science that needs no Archimedean point of view from which it can be assessed.[183] It embraces the formal circularity that this entails and moves on with its projects. Later on, we will discuss the concept of naturalized epistemology in some detail. At the moment, we need to answer the question: following our long discussion of the outwardly nature of consciousness and phenomenal concepts, *which established theory of consciousnesses* would our thesis support?

Section I: The Biological Side of Things

Our understanding of the theoretical framework of studying consciousness falls within the realm of the Biological Theory of Consciousness. According to it, "consciousness is some sort of biological state of the brain"[184] whereby, for instance, the visual experience of motion is identifiable in terms of a brain state of the activation of area MT+ in the visual cortex.[185] We have explained how we see the activation of a certain specialized module as the cause for both a phenomenal concept and its phenomenal content. The theory contends that "the specific geometry of the connectivity matters; […] the location of specific neuromodulators and their effects matter;

what this means is that a subject can't have cognitive higher-brain states without lower-brain functions in operation, *even if the higher-brain state is not about the lower-brain function*.

[183] Patricia Smith Churchland. "Introduction and Historical Sketch," in *Neurophilosophy: Toward a unified science of the mind-brain*. (MIT press, 1989), 265.

[184] Ned Block, "Comparing the major theories of consciousness". In *The Cognitive Neurosciences IV*, ed. M. Gazzaniga, (MIT Press, 2009), 1112

[185] Block, "Comparing," 1112.

[…] the architecture matters; […] the fine temporal rhythms of the spiking patterns matter"[186,187]. It also presupposes that "transfer of coding of information from electrical to chemical and back to electrical is necessary to consciousness"[188]. Thus, our understanding of the biology and neurology of the brain contributes to our understanding of the nature of consciousness.

Naturally, the Biological theory does not operate in a vacuum. In a paper titled "Comparing the Major Theories of Consciousness," Ned Block compares it with two other major theories: Higher-Order-Thought (or HOT) theory and Global Workspace theory[189]. HOT argues that "a [phenomenally]conscious experience of red consists in a representation of red in the visual system accompanied by a thought in the same subject to the effect that the subject is having the experience of red"[190]. Global Workspace is a form of functionalism, whereby the perceptual systems produce representations which are consumed by reporting mechanisms, which in turn supply representations that are further consumed by the same set of mechanisms.[191] Block's discussion is rich and long, and we lack the space to go through it in detail. Rather, what we wish to do is to highlight the points of contestation that our thesis has with HOT and Global Workspace.

Although the Global Workspace theory "is motivated and described in neural terms"[192], it's fundamental claim can be easily applied to silicon-based computers just as it can be applied to biological entities like us[193]. It views consciousness as "an abstract structure that does not include

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[186] Daniel Dennett. "Are we explaining consciousness yet?." *Cognition* 79, no. 1-2 (2001): 234.
[187] This is not to say that Dennett endorses the biological theory. Block cited Dennett's words in his article to criticize Dennett for not acknowledging the obvious. The point is that if Dennett accepts the truth of this statement yet denies the biological theory of consciousness, then that is a contradiction.
[188] Block, "Comparing," 1119.
[189] The rationale Block gives for only choosing these three opponent theories is that they are "theories of consciousness that are taken most seriously by neuroscientists" Block, "Comparing," 1111. We agree with the criteria that there needs to be a level of convergence between philosophers and neuroscientists in order to consider a theoretical framework.
[190] Block, "Comparing," 1111.
[191] Block, "Comparing," 1111.
[192] Block, "Comparing," 1111.
[193] Note that Global Workspace theorists do not make the same distinction between A/P consciousness as Block does. So, although this claim makes sense regarding A-conscious states, it doesn't regarding P-conscious states.

the messy details of neuroscience"[194]. Furthermore, as discussed in Chapter 1, evidence from Zeki's work puts pressure on forms of Global Workspace, which suggest an underlying temporary memory operating in the background, given how subjects systematically mis-bind information about stimuli in their phenomenal perception.

Regarding HOT theorists[195], the problem lies in its over commitment to the cognitive rather than the phenomenal aspect of our mental life. Both Biological and Global theorists see HOT as a hyper-intellectualist thesis, while HOT theorists hold that the Biological and Global Workspace theories "underestimate the role of cognition in consciousness"[196]. In our first chapter, we have already flipped the claim of HOT upside down. Rather than argue that an explicitly A-conscious cognitive thought is required to experience a P-conscious experience, we have established that phenomenal experience is a *necessary* component to have any thought at all, in biological beings. For in cases of sensory restriction where subjects' perceptual systems are deprived of stimulation, the subject's executive system begins to solicit stimulation, either by magnifying the already minimal stimulation available or by creating hallucinatory perceptual content of which it can have a phenomenal experience. Moreover, Block argues that given how "newborns who are circumcised without anesthesia or analgesia are more stressed by later vaccination even 6 months later"[197], and that the "frontal cortex, the likely neural home of thought about thought […] is immature in infancy"[198], then that puts pressure on arguing for the need for an explicit A-conscious thought in order to be able to experience a phenomenal experience.

[194] Block, "Comparing," 1111.
[195] Block is conscious to only critique the more "ambitious" version of the thesis, not other less ambitious versions which allow for the biology to dictate certain aspects of our cognitive life but inly stress the importance of the cognitive over the phenomenal.
[196] Block, "Comparing," 1113.
[197] Block, "Comparing," 1117.
[198] Block, "Comparing," 1117.

Now that we have given a brief account of why we believe the Biological theory has more appeal than other theories, we need to take a look at *which established theory of perception* does our thesis champion.

Section II: First-Order Representationalism, Phenomenalism, and NEF

Within the biological theory of consciousness, two major theories lay claim to the way the operation of perception occurs: first-order representationalism (or FOR) which argues that "any conscious state is a *representation*, and what it's like to be in a conscious state is wholly determined by the content of that representation"[199], and phenomenalism which argues that "the phenomenal character of experience is [not] *exhausted* by such representational content"[200]. Formulated like this, they look like two completely incompatible theses. However, three observations would suggest a deeper affinity between the two theses:

1- Phenomenalism is expansive enough to accommodate representationalist claims. For instance, representationalism insists on the "narrow intentional content" [201] in the phenomenal character of an experience. Phenomenalism does not object to cases of experiences having a narrow intentional content. This much both theories are in agreement about. What phenomenalism *adds* is that the intentional content is not exhaustive of the phenomenal character of the experience. On this view of FOR, the disagreement is on whether or not the phenomenal character is *solely* determined by the content of the

[199] Neil Mehta and George A. Mashour, "General and Specific Consciousness: A First-Order Representationalist Approach", *Frontiers in Psychology* 4 (2013): 1.
[200] Ned Block. "Mental Paint," in *Consciousness, Function, and Representation: Collected Papers* (Cambridge: MIT Press, 2007): 533.
[201] Block, "Mental Paint," 534.

representation. Thus, there's no issue regarding the informational content of experience between the two theses.

2- On Dretske's view of FOR, he maintains that the representationalist thesis concedes that "[t]he qualitative character [qualia] of perceptual experience […] is not functionally definable. It is, however, physically definable"[202]. This view is in agreement with the phenomenalist thesis, given that both theses agree that a biological basis is part of the perceptual experience. Perhaps what Dretske would object to is the claim that the phenomenal content is accompanied by a phenomenal concept, i.e. as the product of lower-brain functions, but this much is not clear from our reading.

3- Misreading of the phenomenalist thesis lead to more confusion about what it actually claims. Mehta and Mashour claim that advocates of the biological theory of consciousness "identifies sensory (and perhaps also post-sensory) processing regions as the neural correlates of general consciousness"[203,204]. Problem is, when reading closely, one cannot find such identification. Block maintains that "[o]f course, an activated MT+ even with feedback to lower visual areas is not all by itself sufficient for phenomenal consciousness. No one thinks that a section of visual cortex in a bottle would be conscious"[205]. Furthermore, as we have stated in an earlier footnote in Chapter 1, Zeki maintains that it is true that "over longer periods of time, in excess of 500 ms, we do see different attributes in perfect temporal and spatial registration, which itself demands an explanation"[206]. This perfect temporal and spatial registration does not suggest that the mere processing of stimulation

[202] Fred Dretske. *Naturalizing the mind*. (MIT Press, 1997), 72.
[203] Mehta and Mashour, "General and specific consciousness", 6.
[204] Mehta and Mashour's specific and general consciousness are correlative to Zeki's micro and macro consciousness.
[205] Block, "Comparison," 1112.
[206] Zeki, "A Theory of Micro-consciousness," 584

within a specialized module is sufficient for general (or macro-consciousness), it only suggests that more research is needed in order to answer how macro-consciousness is possible.

Perhaps one issue that does put a divide between the two theses is the position each theory takes regarding the *semantics* of representation. Chris Eliasmith explains that there are 3 classes of perceptual semantic theories: causal (championed by Fred Dretske and Jerry Fodor), conceptual-role (championed by Gilbert Harman and Brian Loar), and two-factor theories (championed by Ned Block and Harty Field)[207,208]. Within his discussion of Neural Engineering Framework (NEF)[209], Eliasmith differentiates between *encoding*, that is "the process of responding to some physical environmental variable through the generation of neural action potentials, or 'spike trains'"[210], and *decoding*, which is the process by which a system decodes "the value of a variable as it is encoded into neural spikes train"[211]. Between encoding and decoding, Eliasmith maintains that one of the key contributions of theoretical neuroscience has been "not to assume that the stimuli presented to an animal is automatically, or fully represented, despite observed correlations"[212]. This idea puts pressure on the view of the naïve causal theory, under which representationalism can be filed, which says that "a brain state represents whatever causes it to be active"[213]. Rather, this view of the transmission and transformation of information between

[207] Chris Eliasmith, "Neurocomputational models: Theory, application, philosophical consequences." In *The Oxford Handbook of Philosophy and Neuroscience*, ed. John Bickle (Oxford, 2009), [31/40].
[208] Causal Theories uphold that "mental representations are about, and thereby mean, what causes them", conceptual-role theory maintains that the meaning is determined by "the overall role in a conceptual scheme", and two-factor theories "both causal relations and conceptual role are equally important". Thus, the focus of the first two is "on the decoding of whatever information happens to be in some neural state", while the focus on the latter is on both the encoding and decoding. – Eliasmith, "Neurocomputational models," [31/40].
[209] Eliasmith describes NEF as a theoritcial framework that "draws heavily on past work in theoretical neuroscience, integrating work on neural coding, population representation, and neural dynamics to enable the construction of large-scale biologically plausible neural simulations". – Eliasmith, Neurocomputational, models, [3/40].
[210] Eliasmith, "Neurocomputational models," [5/40].
[211] Eliasmith, "Neurocomputational models," [13/40].
[212] Eliasmith, "Neurocomputational models," [5/40].
[213] Eliasmith, "Neurocomputational models," [5/40].

perceptual systems and post-sensory systems changes the nature of the transmitted information lends support to Block's and Field's two-factor semantic theory.[214] But given, as we saw above, that Dretske concedes that the qualia of an experience is physically defined rather than functionally defined, which downplays the conceptual role of his semantics, it is not clear how much difference there is between his theory of representation and Block's two-factor semantic theory.

Section III: Epistemology Naturalized

The natural companion to arguing for a biological theory of consciousness is a naturalized version of epistemology. Quine's thesis comes to the fore as one of the most prominent attempts at giving an argument for naturalizing epistemology. It is, however, outside the scope of this thesis to give a comprehensive argument for it. What we can do is give a brief account of Quine's thesis and run through the opinions of some of its critics to highlights its relevant contributions.

Quine's Thesis

As mentioned earlier in our discussion of the term "neurophilosophy", the central point of Quine's thesis is to do away with any "Archimedean point outside all science from which we can pronounce upon the acceptability of scientific theories"[215]. He describes it as embracing the image of a "mariner who has to rebuild his boat while staying afloat in it"[216]. Quine "believes that science requires no justification beyond measuring up to observation and the hypothetico-deductive

[214] Eliasmith maintains that "[g]iven the NEF characterization of representational vehicles, a representation is only defined once both the encoding and decoding processes are identified. This means that, contrary to both causal and conceptual role theories of content, both how the information in neural spikes is used (decoding), as well as how it is related to previous goings-on (encoding) are relevant for determining content". - Eliasmith, "Neurocomputational models," [32/40].
[215] Patricia Churchland. "Introduction and Historical Sketch," 265.
[216] W.V. Quine. "Epistemology Naturalized," In *Ontological relativity and Other Essays*. (Columbia University Press, 1969), 84

method" [217] and called for "epistemology [to merge] with psychology, as well as with linguistics"[218]. Our project in this thesis, of arguing for the outwardly nature of consciousness and the existence of phenomenal concepts, can be identified in accordance with the Quinian project of determining the "limited alphabet of perceptual norms […] toward which we tend unconsciously to rectify all perceptions. These, if experimentally identified, could be taken as epistemological building blocks, the working elements of experience"[219].

However, this move towards naturalizing epistemology has been widely criticized by some as a move to reduce epistemology to psychology (see for instance Putnam 1982, Stroud 1984, Davidson 1991, and Almeder 2002), while others argued that his thesis is not that different from the program of traditional epistemologists (see Foley 1994 and Jonsen 2005). Nonetheless, a closer look at Quine's own formulation of the issue tells a different story. He maintains:

> *The old epistemology* aspired to contain, in a sense, natural science; it would construct it somehow from sense data. *Epistemology in its new setting*, conversely, is contained in natural science, as a chapter of psychology. *But the old containment remains valid too*, in its way. We are studying how the human subject of our study posits bodies and projects his physics from his data, and we appreciate that our position in the world is just like his. Our very epistemological enterprise, therefore, and the psychology wherein it is a component chapter, and the whole of natural science wherein psychology is a component book – all this is our own construction or projection from stimulations like those we were meting out to our epistemological subject. There is thus *reciprocal containment*, though containment in different senses: epistemology in natural science and natural science in epistemology.[220]

The language Quine uses here is in direct contradiction to the charge of reducing epistemology to psychology. However, as we will shortly showcase in the three instances of criticism we will explore, the issues critics take with Quine systematically miss the mark regarding the true nature of the Quinian project.

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[217] Roger Gibson, "Stroud on Naturalized Epistemology." *Metaphilosophy* 20, no. 1 (1989): 10.
[218] Quine, "Epistemology Naturalized," 89-90.
[219] Quine, "Epistemology Naturalized," 90.
[220] Quine, "Epistemology Naturalized," 83. Emphasis added.

1. Stroud, The Skeptic

In a chapter titled "Naturalized Epistemology," Stroud argues that Quine's conception of epistemology suggests his underlying commitment to skepticism. Stroud maintained that "the specific task for Quine is to understand how our knowledge is possible by understanding how the 'meager input' at our sensory surfaces gives rise to the 'torrential output' in the form of sentences we accept as true about the external physical world"[221]. He maintains that "[t]he theory of knowledge for Quine as for the tradition has its origin in doubt and the threat of scepticism", and proceeds to quote Quine who says, "Doubt prompts the theory of knowledge, yes; but knowledge, also, was what prompted the doubt. Scepticism is an offshoot of science"[222].

Stroud, however, criticizes Quine's declaration that "skeptical doubts are really scientific doubts". He calls this an attempt at a *reductio ad absurdum* to the skeptic project of questioning our knowledge of the external world by assuming that the skeptic must presuppose science in order to question it. Quine's solution was that this presupposition from the skeptic would allow the epistemologist to use the best available science to answer the skeptic, however, Stroud counters that "the fact that 'sceptical doubts are scientific doubts' does not put the epistemologist who raises such doubts in the stronger position of being free to use scientific knowledge of the world in his effort to answer those doubts and explain how knowledge is possible"[223]. In short, Stroud maintains that "the epistemologist cannot use the now discredited science in constructing his/her defense of science"[224].

[221] Barry Stroud, "Naturalized Epistemology," in *The Significance of Philosophical Scepticm* (Oxford University Press, 1984), 234
[222] Stroud, "Naturalized Epistemology," 225.
[223] Stroud, "Naturalized Epistemology," 229.
[224] Gibson, "Stroud on Naturalized Epistemology," 3.

However, as Roger Gibson explains in his rebuttal of Stroud's reading of Quine, for the skeptic to be able to "show that some scientific posits are epistemologically unwarranted, […] his epistemological deliverances presuppose his *interim* acceptance of other scientific posits, namely, those presupposed by his own theory of evidence"[225]. Here is exactly where we spot an instance of appealing to an Archimedean point to judge science through. Quine's main point is that skepticism "does not occur in an ontological vacuum (i.e. transcendentally)" which would then allow the skeptic the space to judge science. In fact, Quine's perceive position is that there is no possible world where skeptic doubts would presuppose nothing whatsoever. And since it has to presuppose some facts about the world, and since there exists a reciprocal containment between epistemology and natural science, then the skeptic cannot maintain an Archimedean point from which he can judge science.

2. Davidson, The Externalist

In his article "Epistemology externalized," Davidson rejects Quine's account on the bases of it being "essentially first person and Cartesian" [226]. He, however, agrees with naturalized epistemology insofar as it propagates "third person approach to epistemology"[227]. The line of argument Davidson takes against Quine is reminiscent of the Moorean commonsense approach to philosophical problems. He maintains that

> as long as we adhere to the basic intuition that in the simplest cases words and thoughts refer to what causes them, it is clear that it cannot happen that most of our plainest beliefs about what exists in the world are false. The reason is that we do not first form concepts and then discover what they apply to; rather, in the basic cases the application determines the content of the concept.[228]

[225] Gibson, "Stroud on Naturalized Epistemology," 5.
[226] Donald Davidson, "Epistemology externalized," *Dialectica* 45, no. 2-3 (1991): 193
[227] Davidson, "Epistemology externalized,"193.
[228] Davidson, "Epistemology externalized," 195.

As much as this point is true, Davidson seems to miss the crux of Quine's thesis. There's no doubt that our concepts are molded by the application – we argued as much in Chapter 2 – however, when it comes to scientific definitions, the appeal to conceptual conventionality is put under pressure. In his explication of the formulation of definitions of scientific terms, Richard Boyd explains, following Quine, that "[t]he correct definitions of a scientific term is an a posteriori theoretical matter, not a matter of linguistic convention or stipulation"[229]. Moreover, as Patricia Churchland maintained, that problems of the failures of imaginability puts pressure on any a priori concepts we may have from conventional use.[230]

Furthermore, on the charge of Cartesianism, we find again the answer to that from Quine himself who maintains that

> The old tendency to associate observation sentences with a subjective sensory subject matter is rather an irony when we reflect that observation sentences are also meant to be the intersubjective tribunal of scientific hypotheses.[231]

Quine here makes the case that if we are to accuse observation sentences of appealing only to the subjective sensory matter while simultaneously using them as a way of communicating information between one another is an oxymoron. And since his theory, not only allows, but advocates and refines observation sentences, then they cannot be making exclusive references only to subjective sensory matters. In short, Quine and Davidson agree on the basics of third-person approach to epistemology, but disagree on the extent of which our concepts, which are molded by sense data, are a reliable source of explaining our knowledge of the world.

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[229] Richard Boyd, "Confirmation, Semantics, and the Interpretation of Scientific Theories", in *The Philosophy of Science*. ed. by Richard Boyd, Philip Gasper, and J.D. Trout. (MIT Press, 1991), 15.
[230] Patricia Churchland criticizes such failure of imagination: "What used to pass for a priori arguments about the impossibility of science discovering this or that (such as the impossibility of discovering that space is non-Euclidean or that mental states are brain states) were sometimes merely arguments based on what could or could not be imagined by some individual philosopher. Since what can or cannot be imagined about the empirical world is not independent of what is already understood and believed about the empirical world, failures of imaginability were all too often owed to ignorance or to inflexible imaginations". - Patricia Churchland, "General Introduction," 3.
[231] Quine, "Epistemology Naturalized," 87.

3. Putnam, The Pluralist

In his article "Why Reason Can't Be Naturalized," Putnam takes issues with naturalizing epistemology, accusing it of following a positivist agenda that seeks to undermine the wide variety of human knowledge in favor of a mechanical account of human reason. According to Steven Wagner and Richard Warner, Putnam champions cultural relativism and argues that Quine's naturalized epistemology is an attack on normativity, and that

> Philosophers who lose sight of the immanence of reason, of the fact that reason is always relative to context and institution, become lost in characteristic philosophical fantasies. "The ideal language," "inductive logic," "the empiricist criterion of significance"— these are the fantasies of the positivist, who would replace the vast complexity of human reason with a kind of intellectual Walden II.[232,233]

He further accuses Quine of occupying an outside point of view which he describes it as "meta-metalinguistic" where "there is no unique "world", no unique "intended model". Only structure matters"[234,235]. He makes reference to Quine's unfortunate formulation of his thesis when he asks the infamous question: "Why not just see how this construction really proceeds? Why not settle for psychology?"[236]. This, Putnam takes it, is a clear assault on normativity and calls it an "attempted mental suicide"[237].

While others, such as Jonsen 2005, agree with him on the unfortunate formulation of Quine's question, we take issue with singling out this one question as a declaration of the death of the normative. The question, presented at the middle of the essay, can just as easily be read as a *rhetorical question*; one which invites the reader to follow along the Quinian line of thought. The

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[232] Hilary Putnam, "Why reason can't be naturalized," *Synthese* (1982): 8
[233] Walden II is a utopian novel by B. F. Skinner.
[234] Putnam, "Why reason can't be naturalized," 17
[235] Putnam is referring to Quine's insistence that the only criterion for science is science itself. Quine wanted to say that only through the structure of science can we legitimize science. An independent model would be anything other than the system of science.
[236] Quine, "Epistemology Naturalized," 75.
[237] Putnam, "Why reason can't be naturalized," 20.

reason for our argument is that the question does not sit right with Quine's later comments regarding the *reciprocal containment* between epistemology and natural science. In this mush Jonsen agrees with our reading: that Putnam misses the mark by neglecting Quine's project of merging together epistemology and psychology rather than eliminating psychology. Jonsen understand that Quine does not seek to eliminate the normative,

> so far is he from proposing to abandon the normative that he is proposing instead to *discover* the norms that govern theorizing by discovering the norms that we conform to in our theorizing. […] What he is actually proposing is to *enlist the aid* of psychology in addressing the burden of epistemology: psychology will identify the norms we adhere to, and philosophy will tell us that, *by virtue* of their being the ones we adhere to, they are the ones we *are to* adhere to.[238]

Nevertheless, one can see the validity of Putnam's concerns within their own context. Wagner and Warner argue that Putnam's concerns follow those of Nelson Goodman, who "defends the arts on the grounds that they make cognitive contributions fundamentally similar to those of science"[239]. If this is the case behind Putnam's advocation for "a centerless pluralism that recognizes the human value of diverse inquiries"[240], then Putnam's issue should be directed towards the purely positivists/eliminativists. However, as it stands, Quine seems to be advocating for understanding the normative, rather than eliminating it. A project which Putnam should have no direct issues with.

Notes on the Theory and its Critics

The idea behind the Quinian project, as Richard Foley crudely and rightly puts it, is "to make sure that our philosophical theories are compatible with science"[241]. However, it does not follow from

[238] Bredo Johnsen, "How to Read" Epistemology Naturalized"," The Journal of Philosophy 102, no. 2 (2005): 88.
[239] Steven Wagner and Richard Warner, "Introduction," in *Naturalism: A Critical Appraisal*. (Notre Dame, University of Notre Dame Press, 1993), 8.
[240] Wagner and Warner, "Introduction," 7.
[241] Richard Foley, "Quine and naturalized epistemology." *Midwest Studies in Philosophy* 19, no. 1 (1994): 243.

this that we restrict our epistemological endeavor to only what science has *already* deemed correct. The idea is that theories must not depend on our desire to "deduce science from sense data"[242], meaning that we do not stop only at what we are capable of conceiving, but to be founded on the best available scientific knowledge, which could be empirically accurate despite our inability to conceive of it through sense data[243]. Remember that Quine "believes that science requires no justification beyond measuring up to observation and the hypothetico-deductive method"[244]. The word "hypothetico" allows for going beyond the *present* state of knowledge, while the word "deductive" insures it is still empirically grounded. As we have maintained in the introduction, even Descartes used the best available scientific knowledge in his endeavor. This tradition continued until Kant and beyond. Thus, the reader of the history of philosophy will find it is not the most radical of ideas[245].

One interesting distinction between Quine and his critics is that the critics seem to unanimously miss what Block called "a confusion about a function of consciousness"[246], namely the distinction between A- and P-Consciousnesses. What they seem to implicitly adopt is what is described by Michael Tye as a transparency thesis[247,248] whereby there's little to no barriers between when a stimulus falls on perceptual system and the utterance of an observation

[242] Quine, "Epistemology Naturalized," 84.
[243] A way to conceive of this is the pressure that Zeki's theory of microconsciousness puts on theories of global workspace and HOT theories of consciousness.
[244] Gibson, "Stroud on Naturalized Epistemology," 10.
[245] It should be noted that we are here alluding to the *instrumentality* of science, as the not so radical an idea, rather than any a priori conceptions of how it should be grounded. The clash between Descartes as a rationalist, and a representative of the traditional epistemologists, and Quine as an ontological relativist does not affect such instrumentality.
[246] Ned Block. "On a Confusion about a Function of Consciousness," in *Consciousness, Function, and Representation: Collected Papers* (Cambridge: MIT Press, 2007).
[247] Putnam speaks of our capacity to revise our understanding of the world by discursive means, Davidson speaks about the connection between linguistic concepts and objects in the world, and Stroud is busied with knowing the set of explicit beliefs a subject has. In the three cases, there's no distinction made between the type of consciousness that is engaged directly with the world and that which is concerned with our conceptual understanding of it, as Block explained in his work.
[248] A full discussion and refutation of the thesis can be found in A. D. Smith's "Translucent Experiences" (2008).

sentence.[249] Quine himself seems at times guilty of that, especially when he speaks about the connection between stimulation and observation sentences. What prompts us to argue that Quine has a similar understanding of the distinction between the two types of consciousnesses is his distinction between doctrinal and conceptual studies, as explained by Johnsen

> In the terms of Quine's broad framework in "Epistemology Naturalized," subjects' constructions of their world-pictures and Carnap's efforts at rational reconstruction fall on opposite sides of his division of epistemology into doctrinal and conceptual studies. Subjects engaged in constructing pictures of the world are developing "doctrines" that are the objects of *doctrinal* studies, which concern, *inter alia*, the justifiability of those doctrines; Carnap's efforts at reconstruction are *conceptual* studies aimed at showing that the everyday concepts employed in *formulating* those doctrines are theoretically dispensable in favor of sense data, or observations, plus logic and set theory.[250]

What this suggests is that Quine at least was aware of the distinction between the nature of the concepts which allow a subject to construct his picture of the world, the phenomenal type, and those used in order to reconstruct a normative view of these concepts, the linguistic type. In our reading of Quine, this mirrors our distinction between phenomenal concepts, generated by the contact between the subject and his world, and linguistic concepts, which carry the discursive mark.

Concluding Remarks

Quine maintained that “it is simply the stimulations of our sensory receptors that are best looked upon as the input to our cognitive mechanism”[251]. Years later, Block made the distinction between A-consciousness and P-consciousness. Then Zeki provided the neural bases which supports Block’s theoretical distinction. These have been the guiding principles of this thesis. We attempted to look at the first part in the process of coming in contact with a stimulation. We began by flipping the position of HOT upside down by arguing that thought requires phenomenal character because

[249] In this treatise we showed, philosophically through Block and empirically through Zeki, and further through NEF, that a transparency thesis does not fit with our understanding of our biology, [i.e. it’s *false*].
[250] Johnsen, “How to Read" Epistemology Naturalized"," 80.
[251] Quine, “Epistemology Naturalized,” 84.

of the outwardly nature of consciousness, then proceeded to argue that any phenomenal content would necessarily be accompanied with a phenomenal concept, and that phenomenal concepts are relevant, both conceptually and behaviorally. We then situated our thesis within the larger theoretical field of theories of consciousness, perception and epistemology, to give the reader a broader understanding of our project. Many questions still remain unanswered after the conclusion of this particular project, but we remain hopeful that the continuous study of the brain will bring to the fore answers to at least some of these questions.

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