

Holoplexity: Theory of Consciousness

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This book is dedicated to my loving wife Joanne,
without whom this book would still only be an idea.

Advanced Endorsement

Be prepared for a phantasmagorical journey into the realm of consciousness. Dr. Sturdevant's unique theory of consciousness, which he has termed "Holoplexity Theory," was designed to provide tentative answers to some of the long-standing questions posed in the literature on consciousness. His theory combines existing theories and previous conceptual understandings with additions based, not only on what has been conceptualized before but also, and most importantly, on his own formulation that builds on these other notable theories. His remarkable thesis sparked my interest in this fascinating philosophical question that is also immensely germane to the field of psychology.

*—Ann-Marie Neale, PhD
Karen Horney Professor of Counseling and Psychology
Graduate Theological Foundation*

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Introduction

This study began as a sincere attempt to answer, “the hard problem of consciousness” (Chalmers, 1996) by the researcher, in a physiological psychology course in graduate school in 2008. The pursuit of a *reasonable account* to answer this question continued as a kind of very enjoyable hobby or avocation for the researcher. In the pursuit of the answers to the many, many sub-questions that popped up, again and again, the researcher found he began to collect *personally satisfactory* answers to many of the numerous sub-questions. Eventually, the author began to see that there was just as much confusion within the literature, as there was a coherent body of information, among the many competing and complementary theories of consciousness.

As the information began to point toward a specific conceptualization of consciousness that the researcher personally held; the researcher decided to add a bit of discipline and structure into this pursuit to determine whether or not it might add up to a *coherent, original account of consciousness* sufficient to answer many of the questions in the literature, but especially the hard problem of consciousness. This dissertation is the result of those thirteen years of pursuing such an account.

To begin: What *exactly* is consciousness? Is it *synonymous with* or *separate from* human consciousness? The nature of human consciousness has been a philosophical and scientific mystery of the ages. From before Descartes’ day to today, it continues to be regarded as an elusive mystery. Some thinkers sincerely believe that this mystery will be solved someday, eventually. Others believe that human beings can never truly understand consciousness due to inherent human cognitive and perceptual limitations. Which is it?

Consciousness, as a term, connotes several things to most people and holds specifically denoted separate and distinct

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meanings within various disciplines of study. Because language is arguably the primary vehicle of transferring knowledge, the confusion and imprecision of language is a serious barrier. Consider that the expression “acting consciously” means acting with awareness of one’s intent, whereas “being conscious” means being aware and acting with one’s faculties, and “acting with social consciousness” means being aware of social responsibility and acting in accord. Consider also that the meaning of the word “unconscious” in sleep science differs from the word “unconscious” within psychotherapy. The imprecision and overuse of the term “conscious” both tend to contribute to a general and ongoing confusion of the meaning within the study of consciousness today.

Today, as mentioned, there is no agreed-upon definition for the term *consciousness*. Does it emerge from the human mind? How does it emerge from the human mind if so? What is this idea of *emergence* exactly? Is the consciousness that human beings experience qualitatively different than consciousness itself? Is there a separation of “consciousness itself” from “human consciousness”? Is consciousness a physical phenomenon, such as space? What is the relationship of consciousness to the idea of time? Could consciousness be even *more basic* than time and space? Perhaps time, space, and consciousness itself are aspects of the same thing? If so, how could this be? And even if it is the same as time and space—what does that have to do with the consciousness that we experience as human beings? Perhaps everything, or maybe perhaps nothing. This study is first an examination of the existing contemporary conceptual findings and theories, and second the building of an *alternative conceptual explanation in principle* for what is known. The new theory combines existing theory with the conceptual creations and additions of the author.

The resultant theory is designed to provide one possible alternative understanding in principle and to provide tentative answers to some of the long-standing questions posed in the literature of consciousness. The term “theory” here is used to denote a coherent system of explanatory hypotheses concerning a particular phenomenon (Reber, Allen & Reber, 2009).

Why put time and energy into yet another theory of consciousness? Is there not an adequate number of these theories

already? As the Australian philosopher David Chalmers (1997) somewhat humorously noted:

Researchers working on the easy problems already outnumber those working on the hard problem by at least a hundred to one, so there is not much danger of the world suddenly falling into unproductive navel-gazing.... Granted that the hard problem is hard, it nevertheless seems quite reasonable for a community to invest a fraction of its resources into trying to solve it. After all, we do not know when a solution will come. Even if we do not solve it immediately, it may well be part of that understanding that comes through searching for a solution that will help us in the future search, in our work on the easy problems, and our understanding of ourselves. *It is in the scientific spirit to try.* (p. 12, emphasis added)

This is where this journey began, and this dissertation and theory are the results of that quest. The author agreed wholeheartedly with this sentiment when it was first put forth. In past scientific developments, once a scientific mystery was identified, *the question itself was opened to all attempts to solve that mystery!* The keyword here is the word *all*. When what has been achieved previously, as specific to mechanistic-style thinking, has provided no solution thus far, it only makes sense then to look for viable answers in places *other than the usual places*.

For the author, the search for the answer here may be likened to a common but exhaustive search for *lost keys*. The search for lost keys is *first* conducted where they are thought they *should be*. However, if that provides no solution, should the search be discontinued? Of course not! The search for the *lost keys* continues in less likely and more uncommon places! This is a parallel situation to the search for the answers to the “hard problem of consciousness” (Chalmers, 1996). We must now continue to look in less likely and more uncommon places for answers. Admittedly, the theory contained in this work constitutes a metaphorically *less likely place*. This theory contains concepts and ideas not found within other theories—which is why it is considered *less likely*. It might also be why this particular theory provides potential answers to questions

that most other theories do not. If correct (or simply *more correct*), this theory may provide a framework for a greater understanding of what consciousness may ultimately turn out to be. Again, it is in the *scientific spirit* that this theory is offered.

Background

The scientific history of consciousness began as a tenuous one, paralleling and often considered interchangeable with the histories of the brain, neurophysiology, and psychology (Blackmore, 2004; Carter, Aldridge, Page & Parker, 2014; Revonsuo, 2010). In this work, *consciousness* is used in a general way. *Consciousness itself* is used as a technical term to denote the *stuff* of what consciousness eventually turns out to be. The term *human consciousness* is used to denote the human experience of consciousness.

The systematic history of *consciousness itself* arguably began with philosopher René Descartes (1596-1650), as the founder of dualism. Arguably, Descartes made the basic distinction between *consciousness itself* and *human consciousness*. This is reflected within the *basic* dichotomy in the literature as monism versus dualism. Generally, *monism* is broadly defined as the world and all reality itself consisting of a singular substance. Descartes' dualism was defined as a dichotomy between the physical and the mental. This conceptual dichotomy was determined to be useful initially within this study but was later determined to be too broad to be useful as it later appeared that consciousness may be expressed *both* monistically and dualistically, depending upon which level it was examined. Given the complexity of what consciousness was hypothesized to be and given that *consciousness itself* as a separate category was not established, it then makes sense that the literature would reflect its state of incompleteness and its relative confusion.

Interestingly, despite all the technological advances of modern scientific inquiry, the Ancients seemed to have already established and occupied many important philosophical positions in the modern-day consciousness debate (Edelman & Tononi, 2000; Frith & Rees, 2017). For example, Baruch Spinoza (1632-1677) proposed that the mental and physical were different aspects of the same singular substance, consistent with the current notion of dual-

aspect theory (Carruthers, 2017; Chalmers, 1996, 2017; Tononi, 2004, 2017). Gottfried Leibniz (1646-1716) hypothesized that mental and physical were composed of different things, but that they were structured to run together harmoniously, consistent with today's notion of psychophysical parallelism (Eccles, 1994). However, Emmanuel Kant (1724-1804) rigidly denied that mathematics and experimentation (thought to be the cornerstones of science) applied to descriptions of mental phenomena as they only vary in the single dimension of time, therefore denying consciousness as a scientific subject.

Several existing theories examined were too specific in scope, or too circumscribed by explanation, to be specifically useful to the search for the human experience of consciousness or for consciousness itself (Carruthers, 2017; Hameroff & Penrose, 1996; Lamme, 2006; Prinz, 2017; Seager & Bourget, 2017; Strawson, 2017; Varela, 1995; Zeki, 1999). Some theories were excluded based on a single factor or multiple criteria. However, many components of theories still are included partially within the findings (Carruthers, 2017; Eccles, 1994; Strawson, 2017). What was very relevant here was the distinction between the *hard* and the *easy* problems of consciousness, as delineated by Chalmers (2017b). Excluded were the theories that tended to focus on the “easy problems” (Chalmers, 2017b, p. 364) of consciousness which included these several criteria: (1) the ability to discriminate, categorize, and react to environmental stimuli; (2) the integration of information by a cognitive system; (3) the reportability of mental states; (4) the ability of a system to access its internal states; (5) the focus of attention; (6) the deliberate control of behavior; and (7) the difference between wakefulness and sleep.

It should be noted that some aspects of these defined *easy problems* are indicative of how human beings “experience consciousness” in contradistinction to how human beings “apprehend” consciousness itself. This fine distinction alone contributes to and accounts for some of the confusion as seen within the literature. It turns out that the complexity of consciousness cannot be easily or adequately captured by a simple dichotomy—it is far richer and more complex than that. We all know about levels of complexity, but we do not typically find such deep rich

complexity in our everyday lives. Interestingly, most of the theories that were deemed “not useful” for this study were both very useful and seemingly correct at many different other levels of complexity.

The search for a viable answer to the hard problem of consciousness began within the human brain, but quickly led outside the brain and eventually to the origins of the universe and reality at its most basic level (but the perhaps most complex level to conceptualize) of understanding. Some concepts are more clearly developed, and so conceptualizations to aid understanding were borrowed from the fields of chemistry, biology, and physics in this pursuit of a coherent account.

Consciousness itself as a distinct, separate substance or phenomenon was expressly limited or *denied* by some theories and theorists on various empirical or scientific bases (Crick & Koch, 1990; Damasio, 1996, 1999; Edelman & Tononi, 2000; Koch & Crick, 1994; Llinas, 2002; Searle, 1993, 2000, 2017). Koch (neurobiological theory), regarding consciousness in a published interview, clearly stated that he believed subjectivity was out of the purview of science (Koch, 1992). Damasio (somatic marker theory) admits his skepticism that science will solve the hard problem of consciousness and purposefully delimits his theory to reflect this. Edelman and Tononi (dynamic core theory) state that they do not believe consciousness is an object, but rather a process. Llinas (thalamocortical binding theory) explained that he does not believe consciousness exists outside the realm of the nervous system function. Like Llinas, Searle (biological naturalism) advocated for a kind of limited consciousness but denied its existence outside of being a *product* of the human mind.

Consciousness itself and human consciousness were variously denied by some theories and theorists as reduced, re-identified, re-labeled, or re-named consciousness as something else (Hameroff & Penrose, 1996; Seager & Bourget, 2017; O’Regan & Noe, 2001; Varela, 1995; Zeki, 1999). Most quantum theories were generally limited to theories of mental *causality* in which the attributes of quantum mechanics were thought to contribute; as such, they were generally restricted to functionally focused theories which did not tend to address the hard problem of consciousness. Modern representationalism theory by Seager and Bourget was found to be

more of an *approach* to information processing within the brain, than a full-blown theory of consciousness; thus, it was far too narrow in scope to answer the broader question of how information becomes an experience and/or its relationship to consciousness. O'Regan and Noe (sensorimotor theory) do not deny consciousness but limit their theory of it to *awareness* of the interaction of the body with environment. Varela (neurophenomenology theory) realized and emphasized the primacy of consciousness but limited his theory to the empirical/methodological issues associated with the first-person perspective as within a third-person dominant scientific paradigm. Zeki's microconsciousness theory is an interesting discovery, one that may turn out to be objectively verifiable, but as written it offers little to the greater understanding of the larger, overall hard problem of consciousness.

Consciousness itself as exclusively human consciousness was denied by some theories and theorists and thus reduced to a kind of mere *functionalism* (Dretske, 2012; Lamme, 2006; Lehar, 2003; Metzinger, 2009; Prinz, 2017; Rosenthal, 2012; Vision, 2017). Dretske and Rosenthal are higher-order awareness (HOA) theorists who believed that consciousness could be explained by the interactive function of a higher-order state over a lower-order state. Lamme (recurrent processing theory) reduced consciousness to mere neural functioning. Lehar and Metzinger are virtual reality (VR) theorists; VR theories tend to limit consciousness to the confines of the brain. Prinz (intermediate level theory) was overly focused on the exact location of where human consciousness may materialize while merely presuming the existence of consciousness itself and giving it no further thought. Vision (emergentism theory) created a new category for consciousness as emergent from neuronal interaction, while not adequately addressing how this might occur.

Consciousness was even denied outright as illusory by some authors (Dennett, 1991; Rosenthal, 2004, 2012). Philosopher Daniel Dennett (multiple drafts theory) famously *explained-away* consciousness in his book *Consciousness Explained* (1991) by asserting that there exists a kind of *fame in the brain* in which one draft of information takes primacy over other competing drafts, rather than conceptualizing human consciousness as an independent

phenomenon. In 2004, Rosenthal (an HOA theorist) joined Dennett in concluding that phenomenal human consciousness was illusory.

There are a handful of theorists that do not deny the existence of consciousness (Baars, 2005; Bohm, 1980; Carruthers, 2017; Chalmers, 1995, 2017b; Dehaene, 2014; Strawson, 2017; Tononi, 2004; Velmans, 1990, 2008, 2017a). Baars' and Dehaene's theories (global workspace theorists) both begin and end with observable phenomena in the brain and that the hard problem did not apply. However, this was not viewed as a denial of the existence of consciousness, but rather a reflection of the *limitation of methods* as well as the fact that Baars and Dehaene were concerned with *human consciousness* and not its nexus with *consciousness itself*. Bohm (implicate order theory), while technically a quantum theorist, did not limit his theorizing to mental causality, but instead espoused a rich, deep theory that began with an ontological interpretation of quantum reality (*as consciousness itself*) and extended to human consciousness and cognition. Like Baars and Dehaene, Carruthers (dual-content theory) had a similarly circumscribed account that did not include consciousness itself, but rather a kind of human consciousness that suggested larger aspects of consciousness by dual qualities. Chalmers (naturalistic dualism theory) admitted that his theory had at least one *missing nonreductive extra ingredient* toward an explanation of consciousness, although Chalmers was able to provide a general description of the missing extra ingredient. Strawson's (physicalist panpsychism) theory limits its focus on "consciousness itself" rather than an expanded theory of consciousness itself including human consciousness. Tononi's (information integration) theory is a mathematical description of experience and is already formatted in the dual-aspect format of the information *bit*. Velmans' theory was a reformulation of an ancient monistic theory (reflexive monism) which posits consciousness itself as being much more pervasive than commonly thought.

Problem Statement

"We know that a theory of consciousness requires the addition of something fundamental to our ontology, as everything in physical theory is compatible with the absence of consciousness" (Chalmers,

2017, p. 364). Chalmers chose to eliminate the “easy problems” of consciousness because he felt that they availed themselves to ordinary, current methods of scientific inquiry. The “easy problems” then will be defined by those problems which avail themselves to current scientific methods. These easy problems of consciousness were *not* the subject of this study. However, as these are interacting systems, some understanding of some processes involved in the easy problems of consciousness may tend to make explicit some aspects of the hard problem. Reformulated in the words of the author: How does *consciousness itself* become *human consciousness*?

The Hard Problem of Consciousness

Chalmers (2005; 2017a) gave an additional overview of what he considered was missing from the study of consciousness. Chalmers (2017a, p. 39) cited the need for an “extra ingredient” that did not exist among the current leading theories of consciousness. Chalmers (2017a) elaborated further, stating:

Why doesn't all this information processing go on “in the dark,” free of any inner feel? Why is it that when electromagnetic waveforms impinge on a retina and are discriminated against and categorized by a visual system, this discrimination and categorization are experienced as a sensation of vivid red? We know that conscious experience does arise when these functions are performed, but the very fact that it arises is the central mystery. There is an explanatory gap (a term due to Levine 1983) between the functions and experience, and we need an explanatory bridge to cross it. A mere account of the functions stays on one side of the gap, so the materials of the bridge must be found elsewhere. (p. 35)

However, the author feels that the key to finding the right answers to missing information is asking the right (or at least different) questions. As necessary, the questions inherent in the hard problem of consciousness will be recursively re-interpreted as the data tends to indicate.

Experience as Fundamental

Chalmers began his study of consciousness by hypothesizing that experience is fundamental. Chalmers (2017b) stated:

Of course, by taking experience as fundamental, there is a sense in which this approach does not tell us why there is experience in the first place. But this is the same for any fundamental theory. Nothing in physics tells us why there is matter in the first place, but we do not count this against theories of matter. Certain features of the world need to be taken as fundamental by any scientific theory. A theory of matter can still explain all sorts of facts about matter, by showing how they are consequences of the basic laws. The same goes for a theory of experience. (p. 364)

Chalmers (2017a) further added, “The hard problem of consciousness is the problem of experience. When we think and perceive, there is a whirl of information-processing, but there is also a subjective aspect (p. 33).”

Chalmers essentially reformulated the hard problem consciousness. The question as reformulated by Chalmers is: *How does information become experience?*

Theoretical Framework

The following is a *general prescription* by Chalmers (2005, 2017b) for an adequate theory of consciousness. As such, it constitutes this book’s *general theoretical framework*. Chalmers (2005, 2017b) laid out the criteria for a more adequate theory of consciousness: (1) It must be nonreductive; (2) it may contain “The Double-Aspect Theory of Information” (p. 370); (3) it retains [an] element(s) of speculation not present in other theories; (4) it must possess “organizational invariance” (p. 368); (5) it must be compatible with the data we have; (6) it possesses “structural coherence” (p. 365); (7) it postulates experience as fundamental; and (8) it should be simple and elegant.

Research Question

Does enough data exist in literature upon which to predicate an original, empirically compatible, nonreductive theory of consciousness sufficient to answer the hard problem of consciousness?

Hypothesis

Sufficient data exists within the literature to predicate an original, empirically compatible, nonreductive theory of consciousness that is sufficient to answer the hard problem of consciousness.

Purpose of Work

The purpose of this work is the generation of an original, empirically compatible, nonreductive theory of consciousness that offers a viable answer to the hard problem of consciousness.

Overview of Methodology

Grounded Theory Methodology

Grounded theory is the methodology of choice for this *type* of study because the outcome desired is a *new* theory generated from *existing* theory. Grounded theory is a *theory discovery methodology* (Martin & Turner, 1986). Grounded theory was the appropriate methodology for this work as the goal was the generation of new theory.

This qualitative study was undertaken by applying the tenets of ground theory's systematic methodology. Grounded theory as a design is a systematic, qualitative procedure used to generate new theory, which in turn explains a process, an action, or an interaction about a substantive topic at a broad conceptual level (Creswell, 2008). Grounded theory refers to an inductive, general method used to build new theory.

The new theory created by this approach was recursively tied back to additional existing data, such that the resultant theory was consistent with some specific aspects of existing data. The purpose

of this study was to not only generate a new theory but also to show clearly how the newly created novel theory related conceptually to existing theory, and to include how some specific aspects were surmised from specific existing theory (*transparency*).

This work uses a qualitative constant comparative analysis *search* for the existing building blocks of what was known about consciousness to lay the foundation of the building of this newly proposed theory. Grounded theory's methods of synthesis and abduction, a new theory was generated, which is proposed as an *original*, empirically compatible, nonreductive theory of consciousness that is believed to be sufficient to attempt to answer the hard problem of consciousness.

The researcher examined and reviewed the existing data then used that data to ground *and* develop the proposed theory. This proposed theory is *grounded* in the data; therefore, it is conceptually well-supported at nearly all levels of development. Consequently, the proposed theory tends to provide answers to several questions posed in the literature. This theory offered an answer to *the hard problem of consciousness*.

Rationale and Significance

The central question of the hard problem of consciousness was thoroughly outlined by Chalmers (1996; 2017a; 2017b). As the framer of this central question, it seemed appropriate and consistent to use Chalmers' own words to illustrate. The researcher's rationale and significance of *this* study are the same as Chalmers'.

Chalmers, in 2017, stated in an interview that consciousness was the key to our sense of *meaning*, "What gives life even the potential for meaning in the first place is, I guess, consciousness. It takes somehow all this activity in the brain or body and turns it into meaning, like water into wine" (Horgan, 2017).

Definitions of Key Terminology

Abduction

Abduction, according to Birks and Mills (2015), is a kind of logical reasoning that begins with an examination of the relevant data and the subsequent formulation of hypotheses. These hypotheses are then either proved or disproved during the process of analysis and thereby aiding in the conceptualization of further theorizing. An example of abductive reasoning is, “because 2-D information gives rise to 3-D information and because it appears to be enabled by the juxtaposition of information, that the 3-D information must be contained within the 2-D information itself.”

Advanced Coding

Advanced coding, according to Birks and Mills (2015), is defined as a technique that is used for the facilitation of integration for a final grounded theory. In this work, an example of advanced coding is the generalizing of the concept contained in the notion of “dual-aspect” from various theories under various differing labels.

Amygdala

Amygdala, according to Carter (2014), is an almond-shaped structure that is a part of the brain’s limbic system; the amygdala “tastes” (p. 127) all incoming stimuli and signals other areas to produce appropriate emotional responses. It is proposed that the amygdala is also one site in which the concept of self is embedded into incoming stimuli.

In this work, certain stimuli, including internally generated thoughts, are thought to cause a change in the body by activating the limbic system, especially the amygdala. In holoplexity theory, it is the amygdala, rather than the hippocampus, that is the predominant purveyor of stimuli and creator of memories as the hippocampus is not mature until about thirty months of age. The amygdala is an important part of the hypothesized temporary sentience acquisition system (TSAS).

Autopoiesis

Autopoiesis refers to a central tenet of the Santiago theory of cognition. Autopoiesis, a term coined by Maturana and Varela in the 1970s, comes from two roots: first is “auto” which means “self” and refers to the autonomy of self-organizing systems, and secondly, “poiesis” which is also the Greek root word for “poetry” means “making” in this context; thus the term autopoiesis means “self-making.” In this study, an autopoietic system, such as the mind, undergoes continual structural changes while preserving its pattern of organization, or identity. An example of this is “learning.”

Binding Problem

The binding problem is a problem related to human consciousness, first recognized by Treisman (1980), about the question of how the background, objects, and emotional features are combined and experienced as a single experience. In this study, an example of this is found within the work of Treisman (1980) and Tye (2017). *The binding problem* is not a focus of this study, but it is a substantive code, and therefore useful in demarcating the boundaries to some of the easy problems of consciousness from the hard one.

Concept of Self

The concept of self (hereafter known as COS) is sentience as a self-referential neurocognitive construct that is combined with ongoing human consciousness and awareness activities which then generates the neurocognitive concept of self. In this study, the COS is integral and appears to be the point at which, upon apprehension by the COS, *consciousness itself* becomes *human consciousness*.

Consciousness Itself

Consciousness itself is used as a technical term here. It refers to the hypothetical irreducible singularity from which *all else* in the universe is comprised. In this study, it is recognized as distinct from

human consciousness and further hypothesized to be the most basic underlying construct of the universe and reality as we know it.

Central Organizing Mechanism

The central organizing mechanism, or COM, is the concept of self (COS) which is hypothesized to become a neurocognitive code and embedded within each memory created, becoming retrievable by virtue of that code, and thereby thought to become the central organizing principle of the brain and mind. In this theory, the COS becomes the central organizing mechanism (COM). This may result in confusion for the human as the *experiencer* because humans tend to attribute “consciousness as experienced” as “internally generated”, instead of “merely apprehended” internally.

Dimension

Dimension as a term in this study is used, first classically, to refer to the commonly known dimensions of 3-D and secondly to refer to the non-spatial features of the hypothetical irreducible singularity of consciousness itself from which *all else* in the universe is comprised. In this study, dimension is used as a broad term. Nothing in holoplexity theory suggests that anything about classical physics or any other branch of science is not as it appears to be. Rather, this is a broad re-conceptualization of the underlying foundation of our most basic assumptions.

Evidence

Evidence refers to research outcomes that tend to lend support to the existence of a concept, construct, phenomenon, or theory. In this study, concepts contained in established and generally accepted alternative theories are considered *evidence*, not necessarily of truth, but of the viability of a specific concept. An example is again that 3-D information appears to be derived from juxtaposed 2-D information. This concept is very well-established in the literature, and thus may be taken as *evidence* that the 3-D information inheres in its 2-D manifestation.

Easy Problems of Consciousness

Easy Problems of Consciousness refers to those questions associated with the study of consciousness which avail themselves to the current methods of scientific inquiry. In this study, the easy problems of consciousness delimit the parameters of the hard problem of consciousness. For example, once the temporary sentience acquisition system (TSAS) and the concept of self (COS) are hypothesized to apprehend electromagnetic manifestations of consciousness itself, those manifestations become human consciousness and a human experience—then after that point in the process, they become the easy problems of consciousness—because human consciousness after this point can be studied via the current scientific methods of inquiry.

Electromagnetism

Electromagnetism refers to the study of electromagnetic force, a type of physical interaction that occurs between electrically charged particles. Electromagnetic force is one of the four fundamental forces and expresses electromagnetic fields such as magnetic fields, electric fields, and light. In this work, electromagnetism is hypothesized to have a dual aspect with consciousness itself and to be highly compatible with other manifestations of itself.

Emergentism

Emergentism refers to the notion that consciousness and conscious states arise from ingredients that are not themselves conscious. This study rejects emergentism as a viable explanatory theory of human consciousness because it tends to implicitly deny the ontology of human consciousness and necessarily consciousness itself. The idea of emergence creates a category and places *emergent consciousness* in it. However, it fails to explain how consciousness arises from non-conscious foundations.

Epiphenomenalism

Epiphenomenalism refers to the idea that mental events are caused by physical events in the brain but have no effect in the physical world. In this study, this is a very complicated problem that is found in parallel to the hard problem of consciousness. It is often used by some theorists to relegate human consciousness to a superfluous byproduct of the brain. Relegating human consciousness to the status of a mere “byproduct” eliminates the hard problem of consciousness and explains the lack of an adequate theory to answer the question(s) associated with the hard problem of consciousness.

Epistemology

Epistemology is a subdiscipline of philosophy that is concerned with the study of knowledge. In this study, epistemology is solely concerned with what human beings can know about the nature of consciousness. Is the nature of consciousness even knowable?

Explanatory Gap

The explanatory gap is a descriptive term coined by Levine (1983) used concerning the hard problem of consciousness to denote the discrepancy between brain *functions* and our *experience* as humans. In this work, the explanatory gap is conceptualized as a substantive code and, as such, was useful in demarcating both the distinctions between the easy problems of consciousness and the hard problem of consciousness and the distinction between human consciousness and consciousness itself.

Extra Ingredient

The extra ingredient is a term coined by Chalmers (1996) that refers to the theoretical inadequacy of current theories to address the hard problem of consciousness without reducing, renaming, or denying human consciousness. Chalmers hypothesizes that there is at least one missing “extra ingredient” necessary to create an adequate theory of (human) consciousness. This suspicion by Chalmers is

echoed in other languages, throughout the consciousness literature in other theories by various other authors cited in this work.

Hard Problem of Consciousness

The hard problem of consciousness is a term introduced by David Chalmers (1996) to describe the difficulty in explaining “dualism” also known previously as the “mind/body problem”. In this work, the hard problem of consciousness is conceptualized, as interpreted by Chalmers (1995), as the question of *how does information become experience?*

Hippocampus

The hippocampus is a seahorse-shaped structure that is a part of the brain’s limbic system. The key role of the hippocampus is the creation and retrieval of memories. It is important to note however that the hippocampus is not mature until the age of about two and a half years.

In this work, the hippocampus is involved in making personal or episodic memories, which may include an emotional component. Consequently, when these memories are retrieved, it creates a *reexperiencing* of these past emotions which may be mixed with current emotions. This is thought to partially account for why an experience has a *feel*. The hippocampus is also one site in which it is proposed that the COS is embedded into incoming stimuli.

Holoplexity

Holoplexity is a term coined by the author. It is used as a descriptive term. The term is a combination of two root words, “whole” or “holistic” as designated by the term *holo-*; and “complexity” or “multiplicity” which is denoted by the term *-plexity*. The term holoplexity was coined by the author to convey the idea of everything as originating from a single source or a single thing.

Human Consciousness

Human consciousness throughout this work specifically refers to the cognitive awareness that human beings possess by virtue of their brains. In this work, human consciousness is specifically proposed to be distinct from consciousness itself.

In Vivo Codes

In vivo codes refer to the verbatim words or phrases found within the data, which are used to communicate a broader concept that is also contained in the data. In this work, in vivo codes are often direct quotes and terms coined by their authors to indicate a specific phenomenon, problem, or concept. Examples of in vivo codes are “the hard problem of consciousness” and the “explanatory gap.” Such codes refer to conceptualizations of problems that exist within the general study of consciousness.

Induction

Induction, according to Birks and Mills (2015), refers to a kind of reasoning which begins with a broader range of concepts that are then “collapsed and integrated” (p. 179) in the process of conducting research. In this work, abductive reasoning is a kind of induction, and both kinds of reasoning amplify premises into generalizations. An example in this work is the proposition that consciousness itself predates the universe since the universe is presumed to exist in time, in addition to having begun with the Big Bang.

Neurocognitive

Neurocognitive refers to both cognitive functioning and the brain structures associated with those processes. In this study, this is an important concept because there is thought to be no real separation between the two. An example is the neurocognitive concept of self. Recalling that it is postulated that there was a time in development in which human beings do not possess the neurocognitive COS, it typically develops with the assistance of the hypothesized temporary

sentence acquisition system (TSAS). This neurocognitive “code” becomes the possession of the brain and of itself. Further, the neurocognitive code becomes embedded into incoming stimuli streams, thus becoming a part of all memories created.

Nonlocality

Nonlocality is typically a quantum physics term and refers to action at a distance. This is in contrast with locality, which means an object can only be influenced by something immediately next to it. In this study, nonlocality is thought to explain “perceptual projection” as a phenomenon, as perhaps the clearest example.

Ontology

Ontology is a metaphysical term that refers to the study of being and existence. In this work, it is the central question behind the concept of consciousness itself. Does it exist as a thing unto itself?

Panpsychism

Panpsychism, according to Revonsuo (2010), is the philosophical theory in which consciousness inheres in all things and all places. In this work, panpsychism is the central, prevailing theory. Holoplexity theory is predicated on this basic philosophical premise but goes a step further in order to propose that *all* things are comprised of consciousness itself, as differentiated and manifest, including three sub-dimensions that humans conceive of as 3-D.

Perceptual Projection

The mystery of *perceptual projection* refers to the question and notion of how proximal neural causes within the brain support experienced events that seem to be outside the brain. This work proposes that human brains are thought to be influenced by the larger timeless dimension of consciousness itself, which is further thought to reside *between* one moment and the next (*effectively*

hidden, as humans are proposed to exist in the aftereffect only, and we possess only a *memory* of the previous moment).

Quantum Theory

Quantum, in physics, refers to the minimum amount of any physical entity that is involved in an interaction; *Quantum theory*, in physics, refers to the theoretical understanding that explains the nature and behavior of matter and energy on the most basic levels of existence. The search for an adequate theory to address the hard problem of consciousness led the author to the most basic level of existence, which is hypothesized to be isomorphic with quantum mechanics.

Recursive

Recursive here refers to relating to the repeated application of a concept or set of procedures, to a successive result. In this work, in grounded theory, it is the continuous changing of the viability of concepts as new information and new concepts become understood by the author.

Reflexive

Reflexive refers to something always referring back to itself, such as the person referring to himself or herself. In this work, this concept is integral to understanding the reflexive monism theory by Velmans (1990), which is a parallel view of the universe as holoplexity theory. Velmans developed his theory to reconcile the schism between the subject and the object within science. However, broken down into its component parts, it states essentially the same thing that holoplexity theory does—that all comes from a single source. In holoplexity theory, that source is consciousness. Velmans does not make this assertion; rather he refers to the single source as the universe. Velmans identifies the perceptual projection problem and admits he does not know how it works.

Sentience

Sentience is a term used here to refer to *self-referential* awareness specific to humans. It is hypothesized that human beings are not born with sentience. Rather, they achieve it as a developmental milestone, typically in infancy or early childhood. In this work, sentience is proposed to be a key concept of the neurocognitive concept of self (COS) as well as the embodied, self-referential “I” which is presumed to be encoded into all incoming sensory streams.

Storyline

The *storyline* is a technique that refers to the strategy of assisting the integration, creation, and formulation of the presentation of research findings in a story format narrative with a plot, beginning, middle, and end. Whether or not expressed as such, the process of grounded theory research is, in fact, a story (Birks & Mills, 2015). In this work, it is the *story* of how the researcher himself became interested in the hard problem of consciousness, how the researcher researched the problem from existing literature, what was added and changed from existing concepts, and what theory was generated from the research. The plot could be expressed in terms of the research goal and the research hypothesis.

Substantive Codes

Substantive codes, according to Birks and Mills (2015), are taken from the descriptive language of the data and typically are in the form of gerunds or *in vivo* codes. “Explanatory gap” by Levine, “perceptual projection” by Velmans, and “extra ingredient” by Chalmers would be examples of substantive codes. In this work, substantive codes were useful in identifying the parameters of the hard problem of consciousness within this study. They were also instrumental in delineating the easy problems of consciousness from the hard problem of consciousness and distinguishing consciousness itself from human consciousness.

Temporary Sentience Acquisition System

The temporary sentience acquisition system, or TSAS, is a term coined by the author to describe a set of brain mechanisms that are temporary in early infant human development that appear to play a crucial role in the formation of the self-referential, neurocognitive concept of self (COS). In this work, such a presumed system is necessary for a human infant to realize that he/she exists, therefore developing a neurocognitive concept of self (COS).

Theoretical Integration

Theoretical integration, according to Birks and Mills (2015), refers to the combining of abstract concepts into a novel grounded theory. In this work, many of the theoretical concepts are not created by the author but existed within the literature (the data). As such, many times only a theoretical concept (and not the entire theory) is used as a part of the resulting theory. Examples of theoretical integration are the concepts of “panpsychism” and “emergence.” These concepts were not created nor discovered by the author but remain integral concepts in the resultant grounded theory.

Theoretical Saturation

Theoretical saturation, according to Birks and Mills (2015), refers to the occurrence of continuing research only adding to existing codes within a particular category, as opposed to identifying new codes. In this work, “dual-aspect” as a concept appeared under several different names, however once re-coded as “dual-aspect” it was realized that dual-aspect as a category was *saturated* among the twenty-three theories of consciousness.

Theory

Theory is a term used here to denote a set of interrelated hypotheses used to provide a conceptual model to provide a greater intellectual understanding of a phenomenon. In this work, “theory” does *not* mean that it is a substantiated account of human consciousness or

consciousness itself. Rather, “theory” in this study refers to the *coherence* of the interrelated hypotheses contained within it, relative to the hard problem of consciousness.

Unfolding

Unfolding is a technical term used by the author to conceptualize something as expanding in complexity from a prior simpler version of itself. In this work, as the clearest example, the author refers back to the “unfolding” of 3-D visual information from two overlapping streams of 2-D visual information. A second example is 3-D information being “unfolded” from 2-D tactile information in the Bach-y-Rita and Kercel (2003) study.

Organization of the Book

Chapter 1

The introduction makes a case for the significance of “the hard problem of consciousness,” contextualizes the work within the field of consciousness studies and provides an introduction to the basics of a comprehensive approach to consciousness. Also in this chapter, the theoretical basis of the study is given and analyzed, in addition to the most relevant literature as-synthesized and critically analyzed. The purpose statement is succinctly made explicit, along with the research question and the underlying overall hypothesis of this study. Key terminology is given and defined as a point of reference and to introduce some readers to some of the more esoteric concepts.

Chapter 2

Literature review contextualizes the hard problem of consciousness within the literature and provides the raw data for this study. This chapter also presents a critical synthesis of the larger themes, justifies how the study addresses the problem in the literature, and outlines the conceptual framework for providing a proposed solution to the hard problem of consciousness. In addition to providing

historical background and examining existing theory relevant to the research question and the associated overall hypothesis of the study.

Chapter 3

The chapter on methodology situates the study within a particular methodological tradition, grounded theory, which is appropriate to its *type* of study. This chapter also describes the research setting, the data collection and analysis methods, as well as provides a detailed description of all the aspects of the design and procedures of this study. Information about human participants in this study is provided in this chapter.

Chapter 4

The chapter on findings organizes and reports the main findings of the *research phase* of the study. Within the appropriate narrative storyline tradition, findings are reported in plain language in a story-like sequential fashion. Findings are reported and flow logically from the problem, research question, and research design. Headings are used to guide the reader through the findings according to the research question, various themes discovered, and other organizational strategies. This chapter also provides foreshadowing as to the direction of the final two chapters. It is the research findings that direct and drive the generation of the evolving theory.

Chapter 5

The chapter on analysis and synthesis provides a discussion of the findings as they relate to the research question, the literature review, and the conceptual framework. The identification of patterns and themes is aspect detailed in this chapter. There is no clear or accepted single *right way* to analyze or interpret qualitative data. Generally, this chapter offers an opportunity to reflect thoroughly on the study findings, including its possible theoretical implications.

Chapter 6

The concluding chapter is a presentation of concluding statements and recommendations. Conclusions are assertions that are based on, warranted by, and grounded in the research. The recommendations are the application of the conclusions. Limitations are identified as potential weaknesses of the substance and scope of the study. This chapter contains the written general reflections of the contribution the author feels he has made to the knowledge and practice within the study of consciousness. It is a validation for the entrance of the research into the ranks of the body of scholars in the field.

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