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Commentary

The Quest for a Unifying Definition and Taxonomy of Consciousness: Narrowing the Obstacles to Mutual Understanding

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The primary intent of this paper is to identify and elucidate various consequential factors that have impeded the attainment of a consensual definition and taxonomy of consciousness. As such, the author explores several etymological, semantic, and sociolinguistic issues, including the troubling conflation of 'conscious' and 'consciousness,' the perpetual promulgation of competing descriptions and types of consciousness, and the confounding polysemantic nature of the term itself. The author addresses the latter issue by proposing the adoption of a simple orthographic convention to disentangle and clearly delineate the tangible and intangible connotations of 'consciousness.' The paper also reviews methodological challenges in consciousness research and the search for the neural correlates of consciousness, and contrasts two opposing notions of consciousness—as a singular phenomenon/thing versus a multifaceted process. In addition, the author examines theoretical and procedural obstacles to classifying consciousness within a cogent taxonomic framework and evaluates several attempts to do so. The paper concludes with suggestions for minimizing the obstacles identified and advances a perspective borrowed from foundational Indian scriptures that may offer valuable insight moving forward.

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Note

When the term 'consciousness' is used in this paper, it refers exclusively to human consciousness.

1. Introduction

> *"What is consciousness?" is a singularly intractable question. It is difficult to know how to engage with it.*
> Hacker[1]

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The study of consciousness remains mired in an unfortunate status quo due to the longstanding inability to formulate a cogent operational definition (OD) and a bona fide taxonomy worthy of consensus. Currently, researchers have cataloged over thirty different theories of consciousness[2][3]); there are more than twenty different 'types' of consciousness cited in the literature, and over the past two decades, there have been several published attempts to advance a taxonomy of consciousness. Unfortunately, this plethora of disparate theories and notions has contributed to a perplexing, and sometimes contentious, scholarly landscape—a predicament I call "The Consciousness Enigma".

To be clear, this paper is not intended to be a comprehensive review and commentary on these various theories and notions of consciousness, and I have set aside matters that are exclusively the purview of philosophy. Rather, my primary intent here is to enhance communication about this subject by identifying and elucidating various etymological, semantic, and sociolinguistic factors that have stifled mutual understanding and the attainment of a consensual definition of consciousness. I also discuss methodological and conceptual issues affecting consciousness research and highlight two competing schools of thought—consciousness as a multifaceted process of various elements of mentation versus consciousness as a singular phenomenon/thing that can somehow be found in a particular locus in the brain. Finally, I focus on taxonomic issues and critically evaluate several recent attempts to promulgate a taxonomy of consciousness.

It is common knowledge that hundreds of years of thought and discourse among Western scholars and scientists have failed to produce a functional definition and taxonomy worthy of consensus, one which specifies exactly what is (and what is not) this ineffable notion we call 'consciousness'[4]. This quandary is reminiscent of the ongoing struggle to promulgate a cogent definition and taxonomy of meditation—another challenging enigma that I have addressed in previous publications[5][6]. I apply some of the same theses that were advanced in those papers to the task at hand in this paper.

Many scientists and philosophers have expressed skepticism about the ongoing efforts to define consciousness. Here are three representative examples (in chronological order):

- A frustrated Sutherland[7] lamented that: "The term is impossible to define except in terms that are unintelligible without a grasp of what consciousness means. Many fall into the trap of equating consciousness with self-consciousness—to be conscious it is only necessary to be aware of the external world. Consciousness is a fascinating but elusive phenomenon: it is impossible to specify what it is, what it does, or why it has evolved. Nothing worth reading has been written on it."
- Bodovitz[8] stated that: "localizing the neural correlate of consciousness is difficult because of the lack of a functional definition of consciousness. We are not sure what we are looking for." I consider this point to be one of the fundamental obstacles in consciousness research and have dubbed it the "OD Dilemma".
- Hacker[9] proclaimed: "If we attend carefully, we may well hear the ancients in the Elysian fields laughing at us moderns, wondering how we can possibly hope to make sense of human nature and of the nature of the human mind with the knotted tangle of misconceptions that we have woven into reflections on consciousness".

Based on comments such as these, one might conclude that the task of defining the notion of 'consciousness' is a hopeless cause, condemned to be the subject of endless acrimonious debate. Rather than joining in this debate, this paper explores the root causes and impediments that have contributed to this 'Consciousness Enigma' and offers several suggestions intended to enhance mutual understanding.

2. Obstacles to devising a consensual definition of consciousness

2.1. The etymology and semantics of 'conscious' and 'consciousness'

The words 'conscious' and 'consciousness' have been closely intertwined for centuries. They are recorded by the Oxford English Dictionary as first occurring at the beginning of the seventeenth century. These words come from the Latin term *conscĭentĭa*, which means "knowledge shared with others" or being a witness to something, and stems from the combination of two words: *scio* (I know) and *cum* (with).

In its early usage, 'conscious' occurred in phrases such as 'being conscious to another' and 'being conscious to something'. But this initial concept eventually evolved into a more personal, reflective concept, e.g., 'to be aware of' something or someone; to focus one's attention on something or be preoccupied by it. It was not until the middle of the nineteenth century that 'consciousness' came to be used to signify wakefulness (as opposed to being unconscious), which enabled discussion of the idea of losing or regaining consciousness[10]. 'Consciousness' as a philosophical concept was not popularized in Western society until the 1600s[9]. Rene Descartes has been widely credited with first mentioning this philosophical notion of consciousness in his 1641 treatise "Meditations". This was followed in 1690 by the famous 'Essay Concerning Human Understanding' by John Locke, who defined consciousness as "the perception of what passes in a man's own mind". It is commonly accepted that this essay strongly influenced 18th-century British philosophy, and in 1756 Locke's definition appeared in Samuel Johnson's "A Dictionary of the English Language".

It is unfortunate that the shared etymology and similarity of the words 'conscious' and 'consciousness' eventually penetrated the scientific, psychological, and philosophical domains, resulting in a commonly seen conflation of these two terms within consciousness research and discourse. In addition, modern disciplines of psychology, psychiatry, philosophy, and neuroscience have promulgated several other related terms, e.g., 'preconscious', 'subconscious', and 'nonconscious', which pose a further challenge to mutual understanding ([1][9][11]). For the purposes of this discussion, these supplementary terms will be set aside in favor of attempting a clear distinction between the two root words—'conscious' and 'consciousness'.

Conflation between these two terms in modern-day usage is common, even among scholars and famous pundits (see Section 2.3.2 below), and is particularly well-exemplified by the following quote by John Searle from his very public and contentious dispute with Daniel Dennett in 1995 (bold highlights inserted by me):

- "About **consciousness**, I must say that if someone persistently denies the existence of **consciousness** itself, traditional arguments, with premises and

> conclusions, may never convince him. All I can do is remind the readers of the facts of their own experiences. Here is the paradox of this exchange: I am a **conscious** reviewer **consciously** answering the objections of an author who gives every indication of being **consciously** and puzzlingly angry. I do this for a readership that I assume is **conscious**. How then can I take seriously his claim that **consciousness** does not really exist?"[12]

By freely mingling these two words in this manner, it is unclear whether Searle is asserting that simply being conscious is the sole requisite for consciousness, or that there is no distinction between consciousness and being conscious and they should be considered synonymous.

This is a prime example of the conflation that arises when two different concepts are treated as if they are the same simply because they sound alike or happen to share the same name or a similar name. This phenomenon was coined the "jingle fallacy" by philosopher and psychologist Carl Hempel, who emphasized the importance of making a clear distinction between ideas based on their characteristics rather than their names, and the use of precise definitions instead of ambiguous terminology[13].

2.2. The polysemantic nature of 'consciousness' and the case for a novel orthographic remedy[1]

Of particular interest to this discussion is the prevalence of two markedly distinct connotations: the tangible physiological states of 'consciousness' (to be conscious) vs. 'unconsciousness' on the one hand, and the more intangible, metaphysical notion as it appears in philosophical discourse and neuroscience research papers, on the other hand. This has created an unfortunate opportunity for conflation and a semantic ambiguity which permits logically awkward and apparently incongruous statements such as: "the subject exhibited evidence of consciousness during a state of unconsciousness".

Clearly, some form of linguistic distinction is required in order to mitigate this semantic duality. As such, this paper calls for the adoption of a simple orthographic convention in order to parse and disambiguate the terms 'conscious', 'consciousness', and 'unconsciousness' when these terms are used in discussions such as this.

2.2.1. Orthography and the application of a new capitalization convention

Orthography is a subfield under the broader domain of Linguistics and is defined as: "the art of writing words with the proper letters according to standard English usage"[14]; "the study or science of how words are spelt"[15]; the rules and guidelines for the written representation of a language, including norms and conventions for spelling, punctuation, hyphenation, and capitalization[16]. This paper argues for the application of the capitalization convention in order to disentangle and clearly delineate the tangible from the intangible connotation of 'consciousness':

- A lowercase format would be employed whenever the term 'consciousness' is used in a physiological context, e.g., by medical professionals in reference to their patients, clinical researchers with regard to their subjects, etc.
  From a medical perspective, there is no doubt that it is of critical importance

to clearly determine if, and when, a patient has lost or regained physiological consciousness. To this end, medical professionals (and clinical researchers) rely on widely accepted criteria and tests with which to make this diagnostic determination, e.g., the original Glasgow Coma Scale[17], updated versions[18], etc. These tests/scores determine different levels of unconsciousness/consciousness according to the responsiveness of the subject based on various clinical parameters such as eye, verbal, and motor responses, and brain scans. Whenever the term consciousness is used in this rather straightforward medical/physiological context, it would be simply denoted in its conventional lowercase form as it appears in this paragraph.

- An uppercase format would be employed whenever the term 'consciousness' is used to refer to the more abstract, intangible, and metaphysical aspect of human mentation as it might appear in philosophical discourse and neuroscience research papers. In this instance, it would be denoted as 'Consciousness'.

As such, the capitalized form of 'Consciousness', abbreviated as ('C'), will appear throughout this paper (except if it is used in the lowercase within a quotation by another author).

2.2.2. Precedence and justification

There is a strong precedent for employing capitalization as an orthographic convention to denote a non-mundane usage of certain words and in certain instances:

1. It is consistent with established English language conventions set forth in textbooks and authoritative references, e.g., for conveying transcendent ideas such as: "Beauty and Truth"[19], or "Freedom"[20]; to show personification such as: "It's not nice to fool Mother Nature"[21]; and to indicate that "something is being elevated from the commonplace for some rhetorical purpose, such as: "still waiting for that One Big Deal"[22].
2. It is routinely used in religious doctrine and common vernacular, e.g., God vs. god, Heaven vs. heaven, Being vs. being, Nirvana vs. nirvana, etc.
3. It is exemplified in discussions of the mundane self vs. the supramundane/supreme 'Self' within the scientific, philosophy of mind, and philosophy of religion literature[23][24][25][26].

2.2.3. Examples of using the uppercase format:

- As applied to the seemingly contradictory/incongruous assertion from section 2.2:
  Original: "the subject exhibited evidence of consciousness during a state of unconsciousness".
  Modified: "The subject exhibited evidence of **Consciousness** during a state of unconsciousness".
- As applied to the Searle quote in section 2.1:
  Original: "I do this for a readership that I assume is conscious. How then can I take seriously his claim that consciousness does not really exist?"
  Modified: "I do this for a readership that I assume is conscious. How then can I take seriously his claim that **Consciousness** does not really exist?"

The tangible, clinical notion of medical/physiological consciousness (based on widely accepted physiological criteria and norms) is obviously much simpler to

define and measure and is far less controversial than the abstract and intangible notion of mental/psychological/metaphysical Consciousness. The remainder of this paper will focus on the latter, highlighting the various obstacles to attaining shared meaning and mutual understanding.

2.3. A plethora of definitions of Consciousness

2.3.1. Dictionaries and various online resources

Various definitions of 'consciousness' have emanated from mainstream dictionaries, thesauruses, and encyclopedias such as the online versions of Webster's, Collins, Cambridge, Oxford, and Wikipedia; the APA Dictionary of Psychology; and AI search engines, e.g., ChatGPT, Google Search, and Chatbot. This has resulted in a potpourri of suggested synonyms: awareness, cognizance, perception, attention, mindfulness, subjective experience, being conscious; the ability to experience or to feel; having a sense of selfhood or soul; the totality of one's thoughts, feelings, and impressions, etc. Unfortunately, society does not provide an authoritative lexicographer who possesses the intellect and wisdom to sort through all these terms/notions and offer a singular, definitive definition that would be universally accepted.

2.3.2. Conflation within the Consciousness literature

The following quotes demonstrate that even some well-respected pundits use words such as 'conscious', 'awareness', 'thought/thinking', 'subjective experience', 'perception', etc., as if they were synonymous with the term 'consciousness': (bold highlights inserted by author).

Dewey, J.[27] "...it should be understood that 'consciousness 'means not a stuff nor an entity by itself, but is short for **conscious** animal or agent, for something which is **conscious**."

William James[28]: "In talking of it hereafter, let us call it the **stream of thought**, of consciousness, or of **subjective** life."

Alan Watts[29]: "Because what consciousness is, is a rather specialized form of **awareness**. When you look around the room, you are **conscious** of as much as you can notice, and you see an enormous number of things which you do not notice."

Bernard Baars[30]: "You are **conscious** and so am I. This much we can tell pretty easily, since when we are not **conscious** our bodies wilt, our eyes roll up in their orbits, our brain waves become large, slow, and regular, and we cannot read a sentence like this one. While the outer signs of consciousness are pretty clear, it is our inner life that counts for most of us."

Antonio Damasio[31]: "Consciousness is defined as "an organisms' **awareness** of its own self and surroundings"

Evan Thompson[32] "If deep-sleep is peaceful and blissful, does this mean we're somehow **conscious** in deep sleep? Is **awareness** present or is deep-sleep the oblivion of **awareness**. Put another way, is deep-sleep. a state of consciousness like waking and dreaming, or is it a state where consciousness is absent as most neuroscientists think today?

Giulio Tononi[33]: "Consciousness is **subjective experience**, the "what it is like" to **perceive** a scene, recognize a face, hear a sound, or reflect on the experience

itself. “

2.4. A profusion of terminology

The Consciousness literature contains numerous attempts to elucidate a compelling definition of “consciousness” by simply modifying/embellishing the root noun with prefixes, suffixes, and/or adjectival qualifiers, without actually defining the root noun. This has resulted in a potpourri of competing terms, and here are some examples:

- Rational consciousness[28]
- Consciousness-as-such[34]
- Consciousness-itself[35]
- Pure consciousness[36]
- Phenomenal consciousness[37]
- Phenomenal consciousness vs. access consciousness[38]
- Creature consciousness and background consciousness[39]
- Cosmic consciousness[40]
- Intransitive, transitive, perceptual, somatic, kinesthetic, affective, reflective, and self-consciousness[10]
- State consciousness vs. transitive consciousness[41]
- Basic consciousness, witness consciousness, and store consciousness[42][43]
- Luminous consciousness[32]
- Other popularized terms such as altered states of consciousness and higher states of consciousness

It is reasonable to question whether this ongoing exercise of clever wordsmithing brings us any closer to a cogent explanandum of Consciousness that inspires consensus, or whether this profusion of terminology muddies the waters with semantic clutter, thereby creating more ambiguity than clarity.

2.5. Sociolinguistic issues

As previously stated, the terms ‘consciousness’ and ‘awareness’ are often treated as synonymous (or essentially the same) within the lexicon of the English language. But does this translate effectively to other languages? This evokes a not-oft-mentioned consideration: the role that sociolinguistics plays in enabling or restricting the terminology we employ to discuss this topic, or even to think about it.

2.5.1. Limitations in translating English into other languages

As exemplified above, English-speaking (Western) pundits typically use their own familiar jargon and favored terminology when attempting to describe or define their conception of ‘C’. However, translation may be problematic. For example, the simple statement **“consciousness is conscious awareness”** may seem rather unambiguous to a native speaker of English, but does it translate in a straightforward manner into other languages? Here is the translation of these three words from four different languages (among many) that do not permit the same differentiation of these terms that is afforded by the English language (per Google Translate). Note the repetition of the exact same word:

- Chinese: “yìshí shì yǒu yìshí de yìshí”

- French: “la conscience est une conscience consciente”
- Latin: “conscientia, conscientia, conscientia”
- Swedish: “medvetenhet är medveten medvetenhet”

It seems plausible to ponder, in this instance, whether the English language is efficacious for conveying these concepts to the non-English-speaking community at large. Regarding the Western notion of ‘C’, Throop and Laughlin[44] suggest that “few peoples on the planet would explicitly recognize the concept as it has been developed in the context of Western philosophy and science, and their languages would have no words that neatly gloss with the English term”.

2.5.2. The relationship between language and thought

The theory of “linguistic determinism” (and the ‘softer’ version known as “linguistic relativity”) advanced the notion that one’s vocabulary can limit the range of one’s ability to think[45]. Language and thought can be considered identical from an epistemological point of view[43], and the way people learn to speak about things plays an important role in how they are conditioned to think about them[44]. Such considerations are likely to be magnified with regard to an ineffable and esoteric notion such as Consciousness. It is reasonable to hypothesize, therefore, that the lexicon of a particular language may influence not only how ‘C’ is conceptualized but also how it is experienced.

One could argue, especially regarding certain immaterial, ‘spiritual’/metaphysical abstractions, that these sociolinguistic factors may limit the ability of English-speaking pundits to communicate their ideas about Consciousness effectively with colleagues (and the general public) from non-English-speaking countries. These considerations strengthen the argument that certain peculiarities of the English language may have contributed to a “Tower of Babel” effect that has impeded the path toward a pancultural, consensual definition of Consciousness.

3. Conceptual, semantic, and methodological obstacles to Consciousness research

The current fascination with the neural correlates of consciousness (NCC) project was made possible by the development of brain mapping technology, arguably commencing with the use of EEG to study meditation in the early 1950s. EEG was the primary technology for brain function investigation for almost 40 years, with over 100 published studies, until the introduction of magnetic resonance imaging (MRI) technology offered an attractive alternative. Beginning with the first brain mapping/scanning study of meditators by Herzog et al. in 1990 (using PET technology), neuroimaging would soon become the dominant research modality for the nascent field of contemplative neuroscience. The invention of BOLD (blood-oxygen-level-dependent) imaging by Ogawa et al. in 1990, and the new functional MRI (fMRI), permitted meditation researchers to avoid the intravenous injection of radioactive tracers required by the PET and SPECT procedures[46].

A parallel interest in the neuroscience of Consciousness heralded the birth of the NCC project (a denotation purportedly coined by Crick and Koch[47]), which would subsequently become the major research endeavor that we see today. Unfortunately, numerous research efforts over the past thirty-five years have

failed to produce a breakthrough, and finding the NCC has remained an elusive enterprise.

Why is this the case?

3.1. Competing theories of how Consciousness manifests

Two competing notions are of interest: 'C' as a multifaceted process involving the interdependence of numerous elements of mentation, versus 'C' as a singular mental phenomenon/thing that can somehow be reduced to neural activity from a specific neural complex, pathway, or locus in the brain.

Regarding the latter, the inability to define 'C' in operational terms begs the question as to whether neuroscientists in search of the NCC as a singular phenomenon/thing can overcome the OD Dilemma: how will they know it, if and when they find it; and how will they describe it in terms that enable other researchers to replicate their findings?

The former may prove more efficacious. Many neuroscientists have advanced the theory that rather than a singular phenomenon/thing, 'C' can be considered an interactive, multifaceted dynamic process, which is inclusive of, but not limited to, a host of various interdependent elements of mentation, such as: intention, volition, attention, perception, processing phenomenal content, cognition, affect, memory, imagination, various stages of dreaming, reasoning, decision-making, self-monitoring (witnessing, metacognition), and perception of time and space[39][48][49][50][51][52][44]; various stages/states of meditation, including the state devoid of phenomenological content[5][6][36]; and an overarching sense of self/selfhood[11]. This approach affords neuroscientists the opportunity to formulate element-specific ODs of these individual elements of mentation, aka "the contents of consciousness"[39], and investigate the neurological basis for their interconnection and functional relationships.

3.2. Definitional and methodological issues

The NCC project has been plagued by the aforementioned OD Dilemma, as well as by other semantic issues, such as the ongoing debate about what is meant by "neural" and what is meant by a "correlate"[39][47][53][54][55]. The lack of an OD of Consciousness is of primary concern. Sidestepping this fundamental component of the scientific method makes it impossible for researchers to demonstrate how their variables are defined and measured so that their data and findings can be analyzed, tested, and replicated by other researchers. The necessity of applying the scientific method in research has been well established[56][57][58][59][60].

With regard to the general landscape of Consciousness research, it is well-documented that neuroscientists have typically pursued diverse theories and rather nebulous concepts without being able to clearly define or measure what it is that they are looking for. Here are five representative examples of this quandary (from [2]):

- "Consciousness is the totality of all effects of the functions of the brain and the supporting nervous system that produces the feeling of the objective world and the subjective mind or self." (Kumar, 2016)
- "Consciousness represents the storage of past events for use in future situations and it is altered by external experience of the organism." (O'Doherty, 2013)

- "Consciousness is the sense of self and sign of life in natural intelligence." (Wang, 2012)
- "Consciousness is integrated information and its quality is given by the informational relationships generated by a complex of elements." (Tononi, 2008).
- "Consciousness is the story that our perceptual system tells us about the world." (Mehta and Mashour, 2013)

3.2.1. Consciousness defined as 'subjective experience'

The following quote by Christof Koch exemplifies the 'consciousness is subjective experience' school of thought:

> "Consciousness is experience. That's it. Consciousness is any experience, from the most mundane to the most exalted. Some add subjective or phenomenal to the definition. For my purposes, these adjectives are redundant. Some distinguish awareness from consciousness. For reasons I've given elsewhere, I don't find this distinction helpful and so I use these two words interchangeably"[50].

In other words, according to Koch, consciousness = experience = awareness. This assertion is not without problems. How can this notion be operationalized for the purpose of Consciousness research? Although anyone can claim to know what "experience" is, it is impossible to find a consensus on what it is and what it is not[2].

3.2.2. The case against using 'conscious awareness' as a sufficient synonym

As previously discussed in section 2.3, when 'C' is equated with the notion of 'conscious awareness' within the English lexicon, it presents sociolinguistic challenges when translated into other languages (see section 2.5). Additionally, limiting considerations of 'C' strictly to mental functions in the conscious/waking state does not address 'C' during various states of physiological unconsciousness, e.g., dream sleep and deep sleep; general anesthesia and sedation; and disorders of unconsciousness such as the various stages of coma (wherein patients exhibit unexpected degradations of mental capacities). Recent research has produced some interesting findings that challenge our conventional understanding of the limits of human awareness:

- 'Connected consciousness' is a documented phenomenon during general anesthesia where some patients can recall details of their surgery and conversations between doctors and staff while they were intubated and monitored during surgery to ensure that they were physiologically unconscious[61]
- 'Covert consciousness' or 'cognitive motor dissociation' is a condition whereby researchers are able to communicate with subjects who are in various stages of coma (who were thought to be unconscious and incapable of responsiveness) by using recent innovations in electrophysiology to detect elements of consciousness not readily discernible by bedside examination[11][62][63][64].
- Lucid dreaming is a well-known technique whereby expert practitioners of Dzogchen dream Yoga[65][66], and secular lucid dreaming[67], can use their

intention to cultivate awareness during the dream state, during dreamless deep sleep, and even to meditate in those states.

These reports, as well as those documented by others[68], contradict the assumption that 'C' is limited to the waking state of conscious awareness. Therefore, it stands to reason that attempts to articulate a unifying definition of 'C' would do well to account for its presence/manifestation in both physiologically conscious and physiologically unconscious states[3][69].

4. Obstacles to formulating a cogent taxonomy of Consciousness

> *A well-conceived and useful taxonomy has the power to frame all theoretical considerations of a particular field of study. It is natural, and in fact historical, for scientists and philosophers to desire to segregate and classify the things and processes of this world.*[70]

It is common knowledge that classifications and taxonomies have been a standard feature in science, philosophy, and a multitude of disciplines for centuries. Ever since the famous 18th-century botanist Linnaeus introduced his seminal system for constructing classifications and nomenclatures of living things, scientists and scholars from the disciplines of Taxonomic Philosophy and the Science of Systematics have continued the process of refining taxonomic theory and procedures. There has been, and continues to be, much debate between pundits in the field as to which approach, under which circumstance, is most efficacious. This has resulted in the promulgation of several well-respected theories and schools of taxonomy. Textbooks on this subject could fill an entire section of the library.

One could reasonably argue that the need to organize and create order in the world extends beyond just scientists and philosophers and could be considered a fundamental characteristic of human nature. Today, the notion of taxonomy has become a standard feature in mainstream society, and even grade school students have become familiar with the Linnaean hierarchy of animals and plants and terms such as 'kingdom', 'genus', and 'species'. In addition, pundits from many fields have inundated Western culture with classifications of all kinds of things. But how can we discern whether a proposed taxonomy is valid and useful for scientific investigation? Which fundamental taxonomic principles and procedures need to be considered in order to make this determination, and how do these concerns relate to Consciousness research and discourse?

4.1. Fundamental precepts of taxonomy[2]

The term taxonomy, derived from the ancient Greek word taxon, refers to the philosophy, principles, and methods which form the basis for "the systematic differentiation and categorization of things and processes of interest", known as 'classification'[71]. This is an essential, and oft-overlooked, caveat – that a cogent, definitive taxonomic philosophy is a necessary prerequisite for formulating an efficacious classification system. In other words, **in order for a classification scheme to be worthy of serious scholarly/academic consideration, it requires an explicit statement of the taxonomic philosophy which serves as its theoretical foundation** e.g., Aristotelian teleology, functional essentialism vs. pheneticism, orthogonal monism vs. pluralism, etc. In addition, the field of

systematics provides tested scientific methodologies for segregating things of interest into reliable and replicable orthogonal categories worthy of consensus[71]. For the purposes of this discussion, a taxonomic proposal that is consistent with these principles and standards will be considered a "bona fide taxonomy" (BFT).

Obviously, anyone can make up their own scheme and call it a taxonomy. However, when well-accepted taxonomic principles and guidelines are bypassed or overlooked, the resultant classification lacks theoretical rigor and is highly vulnerable to challenge and dispute. I have previously argued that classifications which are contrived solely on inductive reasoning, intuition, consensus-building, and statistical analyses; which claim to be an 'empirical taxonomy'; or are advanced simply because they seem to make sense on an intuitive basis, can be seen as vacuous, fundamentally unsound, and should be viewed with guarded skepticism[6]. In our review of taxonomies of meditation, we found that most authors employed a notion of 'taxonomy' as it might be used in common parlance, absent the aforementioned fundamental requirements of a BFT. So, for the purposes of qualitative distinction, when a taxonomy is devised in such a mundane manner, it will be labeled a "generic taxonomy" (GT).

4.2. Taxonomic principles applied to the notion of Consciousness

How do the aforementioned taxonomic principles specifically relate to Consciousness research and discourse, and is a taxonomy of Consciousness even possible?

In order to systematically address these concerns, this paper utilizes a Four Criteria Model for the formulation and evaluation of BFTs that was culled from the taxonomy and systematics literature[6]: Theoretical Taxonomic Foundation, Semantic Lucidity, Orthogonality, and Utility.

4.2.1. Theoretical taxonomic foundation

The first criterion is the widely accepted tenet from the Philosophy of Taxonomy —that all classifications require an explicitly stated theoretical foundation (see 4.1 above). It is perhaps the most important element of the four criteria because its absence can be considered a disqualifying omission.

So, regarding this discussion of 'C', which taxonomic theory is most appropriate? Although two of the most common theories—pheneticism and materialism—have been highly efficacious for the classification of biological entities based on readily observable characteristics, e.g., Linnaeus' phylum, clades, classes, and species hierarchy of the animal kingdom, it is not without problems when this approach (either intentionally or inadvertently) is applied in a "piecemeal"[70] fashion to the classification of immaterial, non-observable processes such as human mentation. As such, Newberg and I have previously argued that a teleological, functional essentialist philosophy and a monist orthogonal methodology are best suited for the formulation of a taxonomy of meditation[5][6], and I posit that those same arguments are applicable to the notion of Consciousness as a multifaceted process (see section 4.4).

4.2.2. Semantic Lucidity

The goal of any taxonomy should be the presentation of arguments and the labeling of categories by employing clear and unambiguous terminology. Consistent with this standard, any proposal for the classification of 'C' should be

predicated on a clear OD of the notion itself, in terms that are relatively easy to understand. When authors use vague, esoteric, and unmeasurable terms to describe and attempt to classify 'C', it becomes impossible for researchers to quantify, validate, and replicate their theses, and the scientific efficacy of such proposals can be called into question.

This issue highlights the importance of relying on stable, well-accepted third-person constructions versus fabricating classification categories based on first-person semantics and/or newly coined terminology which are unmeasurable and wide open to misinterpretation, conflation, and debate.[3]

4.2.3. Orthogonality

It stands to reason that a cogent classification scheme should present an effective methodology for differentiating, segregating, and grouping the totality of processes or entities of interest into a system of mutually exclusive orthogonal categories/domains, whereby all elements within any one particular domain cannot overlap and appear in any of the other domains.

With regard to a classification proposal for 'C', we must be able to ascertain whether scientific investigation can validate that those elements which have been classified within a given domain demonstrate similar neurophysiological and phenomenological parameters to each other and that they are significantly different from the parameters of those elements that have been classified in other domains.

4.2.4. Utility

The proposal should contribute toward a greater understanding of the phenomenological and/or neurophysiological properties and characteristics of 'C' in ways that are measurable and replicable. The proposal should not be overly complex, convoluted, and unwieldy, and other researchers should be able to use the proposed classification scheme to inform and test their own hypotheses about 'C'. According to this model, if a proposal does not satisfy the first three criteria, it cannot satisfy this fourth criterion.

4.3. A critical review of five proposals for a taxonomy of Consciousness

A comprehensive online search of all publications which contained the terms "consciousness" and "taxonomy" in the title was conducted for the period since the emergence of the NCC initiative in 1990 up to the present. Papers dealing with disorders of medical/physiological consciousness were excluded. The search produced five peer-reviewed English-language articles: Cardena et al.[72]; Jonkisc[73]; Kuhn[74]; Pitts et al.[75]; and Sun & Franklin[76].

In a previous review of the taxonomy of meditation literature[6], I consistently found the following three issues of concern:

- virtually no mention, and a total disregard (and/or misunderstanding) of the theoretical and methodological prerequisites of a BFT as is generally recognized by the disciplines of Taxonomic Philosophy and the Science of Systematics
- the ubiquitous use of fabricated first-person terminology that did not meet the standard of Semantic Lucidity
- the inability to formulate viable orthogonal categories as stipulated by the Orthogonality criterion

Given that the notions of meditation and Consciousness share a similar ontology, and both have been historically immune to a consensual definition, it seemed reasonable to assume that the Consciousness taxonomy literature might be plagued with these same issues and shortcomings. To test this assumption, the aforementioned Four Criteria Model was utilized to critically evaluate each of the five publications that were identified.

Upon critical examination, it became apparent that only one of the five publications actually concerned itself with the notion of 'C' per se as it has been framed in this paper, and all five publications presented significant theoretical and methodological taxonomic issues.

- Consciousness: a four-fold taxonomy by Jonkisz, J.[73]
  This article is the only one of the five that discusses the notion of 'C' that is of concern in this paper. Jonkisz argues that virtually all of the conceptions and treatments of 'consciousness' can be classified into four fundamental categories: Epistemic (concerned with kinds of consciousness), Semantic (dealing with orders of consciousness), Physiological (reflecting states of consciousness), and Pragmatic (seeking to capture types of consciousness). He claims that this "four-fold taxonomy" can successfully classify all known varieties of consciousness originating from the fields of cognitive neuroscience, the philosophy of mind, clinical psychology, etc.; and that all of these theories ultimately refer to "a single natural phenomenon" (undefined), analyzed under these "four general aspects".
  This was an admirable attempt, but not without significant theoretical and methodological problems. Unfortunately, no recognized, well-accepted taxonomic theory was mentioned or cited. The four overarching domains of his taxonomy were intuitively derived, and his lexicon is a mixture of first-person (e.g., "Pragmatic") and third-person (e.g., "Physiological") constructs. Jonkisz attempts to classify 'kinds', 'types', and 'states' of 'consciousness' (similar to the list in section 2.3) absent a clearly stated OD of Consciousness itself. In addition, first-person Semantic Lucidity issues render it impossible for him to formulate orthogonal categories, e.g., notions of sense of self/self-awareness appear in both his Epistemic domain (as 'for-me-ness') and his Semantic domain (as 'self-concept", 'recursive self-consciousness', and 'inner sense'). For these reasons, the Jonkisz taxonomy did not satisfy any of the requirements of the Four Criteria Model.
- A landscape of consciousness: toward a taxonomy of explanations and implications by Kuhn, R.L.[74]
  This article did not propose a cogent explanandum or OD of Consciousness. Rather, Kuhn attempted the arduous task of identifying all known theories/explanations of Consciousness and then "to array them in some kind of meaningful structure of high-level or first-order categories" within a "one-dimensional typology" he calls a "landscape". His landscape consisted of 212 various theories segregated into 10 categories. The process was somewhat arbitrary by his own admission: "the Landscape itself, …is limited, and imperfect decisions must be made: which theories to include and which not; where to classify; what is the optimal order; whether to append a possessive name to the theory's title; and the like." No taxonomic principles were mentioned or cited.
- The relationship between attention and consciousness: an expanded taxonomy and implications for 'no-report' paradigms by Pitts, M et al.[75]
  This article concerned itself primarily with 'perceptual awareness' and

proposes an "updated taxonomy of subliminal, preconscious and conscious states". What they call a "Framework" is actually an X-Y graphic representation of stimulus and attention that "maps a wider spectrum of conscious states by incorporating contemporary views from cognitive neuroscience regarding the variety of attentional mechanisms that are known to interact with sensory processing." An OD of Consciousness was not proposed, and no taxonomic principles were mentioned or cited.

- A Consensus taxonomy of altered (nonordinary) states of consciousness: bringing order to disarray by Cardena, E. et al.[72]
  The focus of this article does not deal with the notion of 'C' that is of interest here, and no OD of Consciousness is offered. Accordingly, the term ASC can be considered a misnomer that has been inappropriately employed for altered states of mentation. As stated by the authors: "The concept of ASC we follow here refers to a general functioning or **discernible state of mind different from the ordinary waking one**, not to the basal concept of "consciousness" as the capacity of being (reflectively) aware of something." Regarding whether this proposed taxonomy qualifies as a BFT according to our Four Criteria, I have noted the following matters of concern:
  1. The authors claim their proposal to be a "phenomenologically based taxonomy" of observable "cardinal characteristics" formulated by the consensus of a multidisciplinary team of experts. Although no recognized, well-accepted taxonomic theory is mentioned or cited, according to our criteria, this is an inadvertent attempt to apply a phenetic/cluster analysis methodology toward the classification of an immaterial, non-physical subject. The problems of this approach are discussed in detail in section 4.2 above.
  2. Several of the terms used as main domains in this classification scheme do not meet the standard of Semantic Lucidity, e.g., "Enhanced Physicality", "Imaginal/Fantasy/Visionary", and "Unity/Mystical". See section 4.2.2 for a relevant discussion of the inherent difficulties of employing first-person fabrications such as these versus using stable third-person constructs.
  3. These first two shortcomings result in the inability to formulate orthogonal domains. The authors offer the following disclaimer: "we sought to provide categories in which a member of one category is not also a member of another category, although, in the case of states of consciousness, we are dealing with "fuzzy sets" rather than absolutely discrete, mutually exclusive sets. Furthermore, one state may transform into another, as in simple images turning into complex ones or nonlucid dreams becoming lucid and vice versa, unlike what typically happens with biological taxa."
- Computational models of consciousness: a taxonomy and some examples by Sun, R. and Franklin, S.[76]
  Once again, the focus of this article did not deal with the notion of 'C' that is of interest here, and no OD of Consciousness was offered. Rather, the authors limited the scope of their proposal to an investigation of various conscious and unconscious states. Their stated goal was to provide an explanation of the computational/mechanistic processes that answers the following questions: "What kind of mechanism leads to conscious processes, and what kind of mechanism leads to unconscious processes? What is the functional role of conscious processes, and what is the functional role of unconscious processes? "In their Introduction the authors state: "Given the plethora of models, theories, and data, we try to provide ... an overall (and thus

necessarily sketchy) examination of computational models of consciousness in relation to the available psychological data and theories, as well as the existing philosophical accounts." However, a taxonomy per se was not actually proposed, and no recognized, well-accepted taxonomic theory was mentioned or cited. This raises the question as to why the term "taxonomy" appeared in the title.

4.3.1. Summary of findings

- None of the proposed taxonomies explicitly mentioned or cited a recognized taxonomic philosophy or theory as the basis of its classification scheme.
- None of the proposed taxonomies offered a clearly stated OD of Consciousness.
- They all suffered from other substantive Semantic Lucidity and Orthogonality issues and thus could not satisfy the Utility criterion either.
- As such, I concluded that these proposals could not be considered a BFT, and instead, they warranted a GT designation.

4.4. Which theory of 'C' might be most amenable to a BFT classification scheme?

As previously stated, attempts to promulgate a taxonomy based on the notion of 'C' as a singular phenomenon/thing (i.e., the search for the NCC) are impeded by the fundamental question: how can a taxonomy be constructed absent a clear OD of the very process/thing that one is attempting to classify?

However, those who advance theories of 'C' as a multifaceted process (see 3.1) may have an opportunity to avoid this conundrum. Such an approach could enable the formulation of a taxonomy of the 'contents of consciousness' based on ODs of these individual elements of mentation and the construction of third-person categories capable of orthogonal distinction. Although an assessment of the feasibility of a BFT of 'C' is outside the scope of this paper, the taxonomic philosophy of functional essentialism (as it was employed for a taxonomy of meditation by Nash and Newberg[5][6]) appears to be a reasonable approach.

5. Summary and Recommendations

This paper has attempted to shine a light on several factors that have impeded the progress of Consciousness research and discourse. I believe that many of these obstacles can be overcome, or at least minimized, and to that end, I have proposed several suggestions for consideration:

1. A novel orthographic convention was advanced to enable authors engaged in Consciousness research and discourse to readily differentiate between the tangible notion of consciousness when used in a medical/physiological context (e.g., physiologically conscious and physiologically unconscious states) on the one hand and the intangible mental/psychological/metaphysical context of consciousness on the other. I proposed that we continue to use the lowercase format of consciousness for the former and that we adopt an uppercase format by capitalizing Consciousness for the latter. As previously mentioned, there is a strong precedent for this type of denotation in other related discussions, e.g., 'self' vs. 'Self', 'god' vs. 'God', etc. Why can't we do this here?

2. Given compelling empirical evidence, it stands to reason that any attempt to proffer a unifying definition of ‘C’ needs to account for its presence/manifestation in both physiologically conscious and physiologically unconscious states.
3. In research and discourse, I suggested that pundits would do well to avoid conflating the terms ‘conscious’ and ‘consciousness’.
4. Most of us who are writing in this field can probably relate to the age-old adage that “a scientist (philosopher or researcher) would rather use your toothbrush than your terminology”. This is more than just a joke—it’s a problem. The Consciousness literature is replete with a potpourri of various terms (many of which are neologisms) that have been advanced in the futile quest for a semantic solution to the Consciousness Enigma. I have argued that embellishing the noun with adjectives, hyphenating the noun, attaching prefixes and suffixes, or devising new terminology will just perpetuate the bickering and endless debate at the cost of advancing mutual understanding. This is a plea to curtail the proliferation of new terminology and avoid the ‘jingle fallacy’. I strongly advocate for adherence to the standard of clear and unambiguous terminology instead of using vague and imprecise terms that are difficult, if not impossible, for researchers to operationalize, measure, and validate.
5. With regard to issues in Consciousness research, I discussed the limitations of projects based on concepts that cannot be operationalized and do not satisfy the fundamental scientific criteria of measurability, validity, and replicability. I also argued that since the notion of ‘C’ as a singular phenomenon/thing has proved immune to a consensual operational definition (OD), it is reasonable to consider an alternative approach. The theory of ‘C’ as a multifaceted process might prove more efficacious. It affords the option to formulate ODs of specific, relevant elements of mentation (the “contents of consciousness”) and investigate the neurological basis for their interconnection and functional relationship[39] [48].
6. For all of us using English to formulate and communicate our ideas about ‘C’, I have suggested that we should take into account that our language poses some limitations in our thinking and choice of terminology that may, or may not, be the case with other languages. At the very least, we should consider the possibility that it is not without problems when English is used as a vehicle of discourse for this particular subject, especially when we attempt to communicate and collaborate with colleagues who usually speak and write in a different language.
7. Regarding efforts to promulgate a taxonomy of ‘C’, I pointed out that just because the term ‘taxonomy’ appears in the title of a publication, one cannot assume that a bona fide taxonomy has indeed been derived. To evaluate the merits of such proposals, one must discern whether established taxonomic principles and procedures have been properly applied, or even considered. As such, I advocated for the application of a Four Criteria Model for constructing and evaluating taxonomies introduced by [6]. Of equal importance, there remains the fundamental question that must be resolved: how can a particular phenomenon/thing be classified without a clear definition of what it is?

6. Conclusion

It is most curious that this universally experienced phenomenon we call Consciousness is difficult, if not impossible, to define in simple terms that others can readily accept as true. It is a quandary that has eluded the most brilliant minds in Western culture for hundreds of years. We can only speculate why this has been the case. Perhaps it is due to unbridled hubris—a confidence that the intellect is capable of comprehending and classifying all phenomena and solving all the great mysteries in nature and the universe. Perhaps we should humbly accede that there are certain non-physical, non-empirical abstractions related to spiritual/metaphysical aspects of human existence that are beyond the grasp of language and comprehension at this stage of our evolution as human beings. In other words, "there may be an ultimate explanation for consciousness, but we might not have the intellectual tools to find it."[77]. At least, not yet.

Ancient Eastern philosophy and religion may provide some additional insight here. The famous Hindu Vedanta foundational texts, the Upanishads[78], circa 800–300 BCE, are credited with the first written mentions of Consciousness[32]. According to these teachings, 'C' manifests in the minds of all living human beings and is immutable—that is, it is not subject to change or diminishment by any external or internal factors (thank you to Swami Nityananda for clarifying this point, personal communication, September 2024). In her treatise on the notion of *cit* Consciousness as found within these Upanishads, Gupta notes that the Rishi Masters of that period proclaimed that *cit* "lies beyond the plurality of names and forms; is not accessible through empirical modes of knowing; is the ultimate subject that can never become an object of knowledge; and no description of it is possible except the denial of all empirical attributes"[79]. In other words, Consciousness is just a word that humans assigned to an aspect of human mentation that is imponderable. In this context, the terms "consciousness-itself" and "consciousness-as-such" are redundant. Consciousness is quite simply... Consciousness.

If the Rishis were right about this, it stands to reason that the propensity of Western pundits to attempt to define and classify various forms of Consciousness has been, and will continue to be, an exercise in futility. Perhaps complete insight into this ineffable phenomenon is only available to the enlightened minds of a select few, and the best the rest of us can do is to nibble away at the fringes of this age-old mystery. In the meantime, I argue that we can do a better job of 'nibbling' if we recognize and address problematic limitations in a constructive and collaborative manner.

Finally, it's important to reiterate that this paper was not intended to advance the audacious claim of a definitive solution to 'The Consciousness Enigma'. Rather, my goal here was to identify and elucidate several consequential obstacles to meaningful discourse and to offer some insight and constructive suggestions to enhance communication and mutual understanding.

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Data Availability

Data sharing is not applicable to this article as no new datasets were generated or analyzed during the current study. All literature and sources discussed are publicly available and cited within the reference list.

Author Contributions

J.D.N. is the sole author of this manuscript and is responsible for the conceptualization, literature research, analysis, drafting, and final revisions of the work.

Footnotes

[1] The author posits that this is a terminological innovation since no other similar denotation in the peer-reviewed literature could be found.

[2] For a more detailed discussion, see Ereshefsky[70][80], and Nash and Newberg[5][6].

[3] For a more thorough discussion of the philosophical issues surrounding first-person vs. third-person perspectives and designations, and the issues related to introspectionism, see: [5][81][82] and [83].

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