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Commentary

Reporting and Subjectivity Traps: A Brief Opinion Article on Consciousness as Belief

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This work examines what we consider to be the two main limitations in consciousness science: the reliance on subjective reporting and the assumption of a coherent self. We propose that consciousness may function more as a belief system than an empirically verifiable fact, shaped by the subjective nature of experience and constrained by how we report it. Lacking objective evidence beyond self-reports, even advanced machines might mimic conscious behavior under specific conditions. Concepts like phenomenological zombies—beings physically identical to us but devoid of consciousness—highlight the challenge of distinguishing true conscious experience from mere behavioral mimicry. Experimental designs frequently conflate metacognition (beliefs about perception) with consciousness itself, as seen in Higher-Order Thought theories. These frameworks suggest that our sense of being conscious may stem from metacognitive processes, often resulting in cognitive biases. Studies on brain regions associated with metacognitive accuracy further blur the distinction between consciousness and belief. Additionally, phenomena like delusional misidentification syndromes challenge the assumption of a stable, coherent self that reliably perceives and reports reality. By interrogating these assumptions, we reconsider consciousness not as an inherent property but as an adaptive construct shaped to enhance survival. This perspective calls for a reevaluation of the fundamental nature of consciousness and the correct approach to studying it.

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Key concepts

Consciousness: The ability to subjectively experience perceptions, thoughts, and feelings[1], distinct from mere wakefulness or arousal.

Report: The process of accessing and communicating conscious content, either externally through observable expression or internally as a self-reflective acknowledgment, allowing consciousness to be "reported" or accessed within one's own mind.

Self: The perceived anchor of consciousness, a mental construct that unifies experience, memory, and identity, allowing the mind to perceive an "I" at the center of experience.

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Belief: The brain's interpretive structure, a cognitive lens through which raw experiences are shaped into a coherent narrative, often blending perception with subjective confidence.

Introduction

In contemporary science, the contents of consciousness are often studied through access consciousness—the information we can report or act upon—rather than phenomenal consciousness, the raw, subjective feel of experience[2]. Any unreported phenomenal experience is indistinguishable from unconscious processing, making it inaccessible to study. Thus, scientists rely on access consciousness as the only viable way to measure awareness, as it allows for systematic observation and reporting, even though this approach cannot fully capture subjective experience.

Despite its usefulness, access consciousness introduces two key methodological limitations. The first is the need for action or reporting: even in a resting state, we require some demonstration from individuals to infer their conscious awareness, whether through overt or covert actions. This reliance on reporting creates the reporting trap, as it binds conscious experience to the act of accessing and relaying information. The second limitation centers on the concept of the self. Conscious experiences are generally assumed to involve a perceiving "self," yet this assumption may be a cognitive construct rather than a fixed entity. This subjectivity trap thus blurs the distinction between neural mechanisms related to self-perception and those linked to pure consciousness, complicating efforts to isolate consciousness from self-based beliefs and expectations. Together, these limitations underscore our tendency to view consciousness through the lens of belief, which in turn may shape the very nature of what we consider conscious experience.

These limitations also raise a fundamental question: if consciousness is defined and experienced through self-belief, how can we distinguish between true consciousness and mere behavioral mimicry? Philosophers and scientists alike have speculated on the existence of phenomenological (p) zombies—entities physically identical to conscious beings but lacking subjective experience[3][4]. From this perspective, proving that we are not p-zombies would necessitate two elements: a coherent reporting behavior and a reporter who believes in their own experiences. In this way, our current reliance on the self and reporting reinforces a view of consciousness as belief-based, suggesting that without both a belief in experience and a reporting mechanism, true consciousness remains difficult to verify. Consequently, these methodological constraints challenge our ability to distinguish between genuine conscious beings and entities that simply display complex, self-like behaviors, whether in humans, animals, or artificial systems.

The reporting trap

In consciousness research, subjective report remains the dominant tool for identifying conscious experience. In experimental paradigms, participants are typically asked whether they perceived a stimulus, and this is often regarded as the only theoretically valid measure of consciousness[5][6][7]. Without reports, we cannot be certain whether stimuli were consciously experienced, particularly in resting-state or no-report paradigms where brain activity is compared between assumed conscious and unconscious conditions. Yet this dependence on report

introduces a critical limitation: it conflates consciousness with metacognitive beliefs—our judgments about perception—rather than with perception itself[8].

Higher-Order Thought (HOT) theories of consciousness make this imbroglio explicit. They propose that conscious experience requires a higher-order representation that monitors or meta-represents first-order sensory states[9]. Recent refinements, such as the Perceptual Reality Monitoring (PRM) theory, suggest that consciousness arises when a reliable, predicted higher-order metacognitive representation is activated alongside a first-order perceptual representation. On this view, consciousness functions as a belief system shaped by predictions of reliability[10]. If so, consciousness is inseparable from metacognitive judgments—leaving it vulnerable to distortion by cognitive biases.

Empirical findings illustrate this risk. In a decisive experiment, Rounis et al. [11] asked participants to discriminate the objective location of a visual stimulus while also rating its subjective visibility. While discrimination performance remained stable, disruption of the dorsolateral prefrontal cortex via transcranial magnetic stimulation selectively impaired visibility ratings, uncoupling subjective report from objective accuracy. This result suggests that metacognitive monitoring, rather than first-order perception, was disrupted. However, it is important to note that these findings have not yet been replicated[12], and that other candidate processes, such as attention, also appear insufficient to fully account for conscious experience[13].

The blurring of consciousness with report is not confined to laboratory tasks—it pervades clinical practice as well. Most “consciousness tests” (C-tests), including those used for disorders of consciousness (DoC), rely directly or indirectly on report. Even simple behavioral markers, such as sniffing in response to verbal commands, function as reports of comprehension[14]. Putatively report-independent measures, such as the Perturbational Complexity Index (PCI), remain validated against the Coma Recovery Scale–Revised (CRS-R), which itself depends on verbal or behavioral reports[15]. In practice, the ability to communicate has become the default proxy for consciousness, echoing a folk-psychological intuition: if one can share internal states, one must be conscious. Yet this proxy is clearly limited: deaf–paralyzed patients or non-lucid dreamers may be conscious while unable to report.

Other theoretical models further reinforce this confusion. The Global Neuronal Workspace Theory (GNWT), for instance, is often described as an explanation of consciousness understood as the ability to “self-report”[16][17][18][19]. This framing conflates consciousness (subjective experience) with two distinct constructs: self and report. Yet consciousness can occur without a sense of self (e.g., in meditation or psychedelic states) and without report (phenomenal consciousness). Appeals to “internal report” do not resolve this confusion. Moreover, by treating access consciousness as sufficient for phenomenal consciousness, GNWT highlights the conceptual inconsistency between defining consciousness as self-report and acknowledging the existence of unreportable experiences[20].

Attempts to refine report-based methods illustrate both progress and limitation. Subjective visibility scales, such as the Perceptual Awareness Scale[21], aim to capture richer dimensions of perception—clarity, confidence, vividness—beyond mere task performance. While these tools provide nuance, they also acknowledge

the role of metacognitive beliefs in shaping what participants call “conscious.” In effect, they further confirm that consciousness research continues to measure beliefs about experience rather than experience itself.

In summary, the reporting trap highlights a central limitation of consciousness science: by equating consciousness with subjective report, we risk conflating perception with metacognition and communication. This reliance obscures the true nature of conscious experience and raises conceptual tensions in both theory and practice. Addressing this trap will require methodological innovation —developing measures of consciousness that are less dependent on self-report and communication, while still remaining empirically grounded.

The subjectivity trap

Researchers delving into consciousness through subjective reports often operate under the assumption of a self that knows what is to be known. This assumption is exemplified in the minimal-self hypothesis, which claims that “it is necessarily the case that whenever there is a conscious experience, there is a self”[22]. The operational definition of self generally includes processes tied to personal identity, such as memories of one’s name or body image, and may extend to body maps. While we may not have reached a consensus on defining the self, it is widely acknowledged that involuntarily losing one's sense of self constitutes profound psychological suffering[23]. However, the assumption that a coherent self exists within the brain, capable of subjective perception, may be misleading. Observations from delusional misidentification syndromes (DMS) reveal significant inconsistencies in this belief. For instance, asomatognosia, a form of DMS arising from right hemisphere lesions, can lead patients to disown parts of their bodies, perceiving them as foreign. Conversely, some individuals experience a form of delusional reduplication, believing compromised body parts exist as separate entities in an illusory child or other person[24].

The notion of self has an evolutionary purpose, as it fosters the sense of unity in a system, despite the coexistence of many cognitive and perceptual systems that function in parallel. But this is more likely to be a useful belief than an objective truth or natural phenomenon. The self is a concept as confused and composite as consciousness, and we should not rely on it to conceptualize consciousness. Moreover, living in an individualistic society might bias the dominant (academic) view on consciousness: the subject and the self are perceived as central in the Western world; thus, they are assumed to play a role in conscious experience. But what about other alleged characteristics of consciousness, such as shared experience and interconnectedness? One hypothesis still to be explored would be that some minority cultures do not see the need for a subject or a self to exhibit conscious experience. In this line, one could argue that we have some evidence of consciousness without a self, as studies seem to suggest in meditation or psychedelics research[25][26]. Finally, possible new forms of consciousness might challenge this need for a self, for example, in the case of organoids[27].

These reporting inconsistencies are not just reflections of external influences; they suggest that our conscious experience itself might be rooted in internal biases—specifically, the belief in an enduring self. The brain, shaped by evolutionary pressures, seems predisposed to create distinctions between “self” and “non-self,” constructing an illusory identity that organizes incoming information around a central “I.” In this way, consciousness may operate more like a belief system, with its foundations resting on potentially flawed

assumptions, most notably, the assumption that “I exist.” This presents a significant methodological challenge for consciousness research.

If consciousness is fundamentally intertwined with the subjective belief in an “I,” researchers face a circular problem: studying consciousness inevitably reinforces the assumption of a perceiving self, as reports and introspections are interpreted through this lens. We call this the subjectivity trap, where consciousness is constrained by the very self it seeks to understand. This circular logic—“I exist, therefore I am conscious,” and “I am conscious, therefore I exist”—introduces a foundational bias into experiments. The subjective reports we rely on to infer consciousness are thus inseparable from an implicit self-reference, blurring the line between what is consciously experienced and what is merely believed to be self-related.

Moreover, if we accept that we are all fundamentally composed of biology and chemistry, the distinction between a conscious being and a p-zombie becomes increasingly insignificant. We may well believe we are conscious and that our experiences are unique, yet this belief alone does not prove the existence of consciousness. It raises the unsettling possibility that our rich inner lives could be mere illusions, akin to the idea that our perceptions may not directly reflect an underlying reality and that cognitive sciences could fully explain our experiences without invoking any mysterious essence[28][29][30].

Methodologically, this creates a dilemma: we rely on subjective reports to study consciousness, but these reports are inherently biased by self-belief, potentially distorting our findings. Any data derived from self-reports are constrained by the participant's metacognitive beliefs about their own consciousness, reinforcing the assumption of a coherent self, a narrative[31]. Until we can differentiate between consciousness and this belief-based "self," our ability to objectively measure conscious experience remains compromised. In other words, the reliance on subjective reports may obscure our understanding of consciousness itself, potentially conflating genuine conscious experience with constructs of self-reference and belief. This fundamental issue challenges researchers to question whether their methods capture consciousness as it is—or merely consciousness as it is believed to be by the reporting subject.

All in all, the subjectivity trap suggests that our understanding of consciousness is inherently biased by the belief in a perceiving self. This circular assumption—seeing consciousness as inseparable from the self—makes it difficult to study consciousness, as subjective reports may reflect self-belief rather than true conscious experience. If we are, at our core, no different from philosophical zombies, then the very essence of what we consider consciousness may warrant deeper scrutiny and reevaluation.

Alternative views

We have argued throughout this article that consciousness may be better understood as a metacognitive belief—that is, a belief we hold about our own perceptions or sensations as being part of ourselves. However, critics such as Chalmers[32] contend that consciousness is directly experienced and possesses phenomenal qualities that cannot be reduced to a mere belief about internal states. Alternatively, advocates for indirect behavioral and neural measures (e.g., [33]) argue that neuroimaging and computational models might offer insights into conscious contents without requiring explicit reports, potentially bypassing the limitations of self-report biases. Here again, critics like

Chalmers[32] and Block[34] argue that focusing exclusively on access consciousness may overlook essential aspects of phenomenal consciousness that, though challenging to study directly, cannot be ignored. In response, they suggest refining introspective methods or incorporating indirect measures like physiological responses to capture these elusive experiences.

Importantly, our definition of consciousness aligns with access-consciousness, such that awareness and consciousness largely coincide. In contrast, certain frameworks (e.g., [35]) treat awareness as a prior, selfless experiential stage, and consciousness as emerging only when the organism intentionally selects and integrates certain contents of awareness. While this distinction is conceptually appealing, it posits a form of subjectless experience that, in our view, is difficult to distinguish from unconscious or pre-conscious processing: without access or ascription, 'raw experience' becomes empirically indistinguishable from unconscious perception. Nevertheless, both approaches converge on a key structural point: consciousness requires selecting a subset of potential contents to be foregrounded. From our perspective, this is precisely where the reporting and subjectivity traps arise, as the subject performing this selection—and the stability of the selection process itself—remains fluid and challenging to isolate empirically.

It has also been argued that we may be conflating a special subset of conscious moments—those in which we explicitly ask ourselves, "Am I conscious?"—with consciousness as a whole[36]. These self-reflective episodes may indeed capture what we intuitively mean by "being conscious," but they are not representative of the full range of phenomenal experiences. Current definitions risk conceptual confusion if they treat these introspective moments as paradigmatic of consciousness itself.

Moreover, the subjectivity trap may have its critics. Some argue that self-referential processing, rather than distorting consciousness, might provide an essential framework for organizing experience (e.g., [37]). From this view, the self is not merely an illusory construct but serves a functional purpose, aiding in the coherent integration of conscious experience. Others, like Dennett[29][30], challenge the concept of p-zombies, arguing that consciousness is fundamentally linked to behavior and brain function. By focusing on observable criteria rather than subjective self-belief, we might still attribute consciousness meaningfully without relying solely on self-report measures.

In recent years, the need for novel ways to assess consciousness in non-human entities has highlighted the limits of report-based methods and the importance of developing innovative tests[38]. One prominent example is the Unlimited Associative Learning (UAL) framework, originally developed for animals, which proposes that the ability to flexibly learn from novel stimuli can serve as a marker of consciousness[39][40].

A distinct challenge has arisen with artificial intelligence: for the first time, we encounter entities capable of reporting while lacking consciousness[41]. Such potential false positives motivate the creation of more sophisticated "Turing-style" tests, including the AI consciousness test, which evaluates an AI system's deep understanding of consciousness-related concepts[42].

Although subjective report remains the current gold standard, emerging conceptual strategies are increasingly necessary. Rapid technological advances (e.g., AI, organoids, xenobots), the growing number of unresponsive patients due

to life-sustaining interventions, and the ethical stakes in animal research all demand assessment methods beyond reporting. False positives and false negatives carry serious consequences, and methods proven in non-human studies could guide the development of robust, report-independent tests. Crucially, these approaches should remain sensitive to non-anthropomorphic forms of phenomenal experience.

Finally, despite its limitations and biases, reporting retains value. Reports can reveal internal states not yet accessible objectively, and beliefs about one's own experience—such as pain—have ethical significance. Consciousness may not transcend current scientific reach, but the moral relevance of subjective experience persists and should not be dismissed. Importantly, not having a belief system should not be considered enough to exclude entities from the moral circle, and ethical considerations should remain for entities that might not have beliefs about their own experience but only something akin to raw sentience.

Conclusion

In sum, the challenges of the reporting and subjectivity traps in, at least, access consciousness research underscore the tension between consciousness as experienced and consciousness as believed. Our reliance on subjective reports and the assumption of a perceiving self can distort the very phenomena we seek to understand, binding consciousness to self-belief and internal judgments rather than objective reality. In this sense, our exploration of consciousness becomes entangled in what Daniel Dennett might have called an "illusion" of sorts, where our constructs of self and consciousness shape, and perhaps even mask, our true experience. Dennett's work frequently questioned the assumptions underpinning conscious experience, suggesting that much of what we take for granted about our conscious experience may be built upon cognitive tricks or illusions that aid in survival rather than pure reflection of the mind's depths. In this light, consciousness could be seen as a "user interface" designed not to reveal reality as it is but as our brains interpret it—a synergy of perception, belief, and functional coherence that allows us to navigate the world.

In the spirit of Dennett's skepticism, we might push consciousness studies to ask whether what we are studying is truly a raw experience or a cognitive construct that serves our evolutionary purposes. By refining our methods and acknowledging the circularity between self and consciousness, we may one day disentangle the genuine facets of experience from the beliefs that accompany them. Until then, the subjectivity and reporting traps remind us to approach consciousness with cautious humility, recognizing that what we access and report may not fully capture the essence of conscious experience.

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No potential competing interests to declare.

Data Availability

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Author Contributions

- A.M. conceived the article, coordinated the revisions, and drafted and revised the main text.
- J.S. contributed to the final modifications and integration of peer feedback.
- M.O. contributed to the conceptual framework and revisions.

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