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Consciousness, Subjective Facts, and Physicalism – Fifty Years since Nagel's Bat[1]

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Abstract

Research Article

The existence of subjective facts in the epistemic sense defined by Thomas Nagel's famous article, "What is it like to be a bat?" might be taken to support an anti-physicalist conclusion. I argue that it does not. The combination of nonreductive physicalism and teleo-pragmatic functionalism is not only consistent with such subjective facts but predicts their existence. The notion that conscious minds are self-understanding autopoietic systems plays a key role in the argument. Global Neuronal Workspace Theory is assessed in terms of its potential to answer David Chalmers' Hard Problem of consciousness. A suggestion is made for augmenting the theory that involves another sense in which facts about conscious experience are subjective. The idea of conscious minds as self-understanding systems again plays an important role.

Keywords

Consciousness, Subjective facts, Physicalism, Self-understanding.

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It has been fifty years since the appearance of Thomas Nagel's seminal article, "What is it like to be a bat", arguably the most influential philosophical paper ever published on consciousness (Nagel, 1974.) Nagel wrote, "Consciousness is what makes the mind-body problem really intractable. Perhaps that is why current discussions of the problem give it little attention or get it obviously wrong" (Nagel, 1974, p. 435). Half a century later, consciousness is no longer neglected. Indeed, it is a topic of intense philosophical, psychological, and neuroscientific debate with specialty journals devoted entirely to it, including *The Journal of Consciousness Studies, Neuroscience of Consciousness,* and *Consciousness and Cognition.* The Association for the Scientific Study of Consciousness (ASSC) held its twenty-sixth annual meeting in New York City in June 2023 with nearly 700 interdisciplinary participants. Yet many will still argue that consciousness presents an insuperable obstacle to any adequate physicalist theory of mind. Indeed, Nagel gave a keynote address at ASSC 26 in which he reaffirmed his earlier views about the resistance of consciousness to standard physicalist explanation (viewable at https://youtu.be/VU4u-LfkI7w). Thus, this special issue seems an apt time to review the controversy and the current status of Nagel's concern. Given the extensive literature, I will not attempt to offer a general survey of the debate, but only a brief personal perspective on one major issue that involves metaphysical claims based on supposed epistemic facts about consciousness. Consciousness, according to Nagel involves what he calls "subjective facts" (Nagel, 1974), and their existence might be taken to refute physicalism. I will argue that it does not.

First, some clarification is needed. "Consciousness" can be interpreted in multiple ways, so we need to be clear about the sense in which it is supposed to be problematic. The word "conscious" is doubly ambiguous, both in the sorts of things to which it applies, as well as in its specific meaning. The conscious/ unconscious distinction may mark a division with the domain of creatures or systems –so-called "creature consciousness". Or it may distinguish within the mental realm between those mental states or process the conscious and those that are not –so-called "state consciousness". Perceptions, memories, and inferences can all occur both consciously and unconsciously. A type of organism might count as conscious in the creature conscious sense, even though many of its mental states and processes occur unconsciously. Indeed, we humans are just such beings. We are no doubt conscious creatures, but only a small subset of our mental states and processes are conscious in the state-conscious sense. Much of our mental life occurs unconsciously, but we count as conscious creatures because at least some of our mental states are conscious.

The title of Nagel's article makes clear that his primary concern is with creature consciousness. He chooses bats rather than bees as his example because we count bats as clearly conscious creatures. And in explaining why we do so, he introduces his famous criterion for being a conscious creature: X's count as conscious creatures *just if there is something that it is like to be* an X. Bats are conscious because there is *something it is like to be* a bat –some subjective way it appears to the bat from the inside. Drones are not conscious because there is nothing that it is like to be a drone –at least not current drones. And we are not sure whether honeybees are conscious because we do not know if there is anything that it is like to be a honeybee.

The focus of the criterion is on the experiential or subjective aspect of consciousness. Thus, in terms of Ned Block's distinction between *phenomenal consciousness* and *access consciousness* (Block, 1995), Nagel's concern is with the former. Block's distinction applies in the first instance to mental states, but it indirectly applies to conscious creatures. A mental state is phenomenally conscious (P-conscious) just if there is something that it is like to be in it, and a creature is phenomenally conscious if some of its mental states are P-conscious. By contrast, a mental state is access-conscious (A-conscious) if its content is reportable and available to guide a broad range of intentional behavior. It is P-consciousness, not A-consciousness, that presents a major challenge to physicalism, a fact that is also mirrored in David Chalmers's famous distinction between the so-called "hard problem" of consciousness and the various "easy problems" (Chalmers, 1995; 1996). Solving the easy problems involves explaining how the physical structure and organization of the brain suffices to produce the functional and information-processing properties of conscious states, which largely concerns the features of A-consciousness. Solving those problems may require a lot of scientific research, but they are "easy" in that they supposedly do not involve an in-principle obstacle or a deep metaphysical puzzle. The hard problem is the challenge of explaining how the physical properties of the brain could give rise to full-blown phenomenal consciousness, that is, how they could produce states with experiential what-it-is-likeness. Most parties to the debate believe the easy problems are in principle solvable. However, there is less agreement about the hard problem, and some philosophers including Chalmers deny that it can ever be solved, a fact which they take to imply the falsity of physicalism (Chalmers, 1996).

Having clarified that Nagel's primary concern was with phenomenal creature consciousness, I turn to consider a main argument he gave to support

his anti-physicalist conclusion (Nagel, 1974; 1975). That argument relies on an epistemic distinction he draws between two sorts of facts: objective facts and subjective facts. The basic objective/subjective contrast is familiar from ordinary language, but Nagel defines it in a technical sense which turns on the notion of a point of view. *Objective* facts are those that can be fully *understood from many epistemic points of view*. By contrast, *subjective* facts can be fully *understood only from a particular epistemic or experiential point of view*. It is to illustrate this distinction that Nagel appeals to the bats of his title. Many bats perceive the world through echo-location. They emit chirping sounds and use the echoes bouncing off objects in their surroundings to construct highly detailed representations of their environment. Because we humans have no similar sense modality, we are unable to empathetically imagine the bat's sensory experience. We can scientifically determine which aspects of its world the bat is able to discriminate, but we cannot ourselves share similar experiential states. Thus, facts of the former sort are objective facts that can be equally understood from multiple points of view, but facts of the latter sort are subjective facts that can be understood only from the bat-like point of view. Because we humans cannot have such experiences, we cannot fully understand what it is like to be a bat.

The existence of such subjective facts seems to provide a simple argument for an anti-physicalist conclusion about consciousness. Physical facts seem to be paradigmatically objective facts; they can be understood from many different points of view. The facts of physical science can be equally well understood by humans and by intelligent aliens who share none of our sense modalities and whose perceptual experiences involve completely different phenomenal qualia. In that sense, physical facts count as objective facts. However, for the reasons given by Nagel, facts about conscious what-it-is-likeness seem to be subjective facts. They cannot be fully understood from many points of view, but only from the point of view associated with creatures that themselves have the relevant type of experience. Thus, if physical facts are objective and experiential facts are subjective, it follows that experiential facts are not physical. The reality of conscious experience seems to imply the falsity of physicalism as a comprehensive claim about reality. There are real facts–subjective facts about experience–that fall outside the physical domain. The argument moves from epistemic claims about the limits on our ability to understand the what-it-is-likeness of conscious experience to a metaphysical conclusion of anti-physicalism.

At least two lines of reply are open to the physicalist. First, the physicalist

might attempt to give a reductive explanation of consciousness, one that explains experiential facts in physical terms and thus makes them into objective facts. This is the path taken by many physicalists. The second and less common alternative would be to deny that all physical facts are objective. The nonreductive physicalist might argue that the existence of subjective physical facts – that is, of facts that are physical but can be understood only from a particular experiential point of view – is compatible with physicalism and perhaps even entailed by it. Physicalism on that interpretation concedes that there are facts we cannot fully understand from the physical perspective, but it remains committed to the metaphysical claim that everything real is physical. I will opt for that second strategy and argue for the existence of facts that are both physical and subjective.

To see how physicalism might accommodate subjective facts, one should view the issue from the dual perspective of nonreductive physicalism and what we may call the "teleo-pragmatic functionalism". As I have argued elsewhere, the two components of the view are complementary and mutually supporting (Van Gulick, 2011).

Nonreductive physicalism (NRP) in this sense combines a metaphysical commitment to physicalism as an ontological thesis with a pluralist view about the theoretical and conceptual resources needed to explain and understand the many diverse levels of reality. It rejects the traditional reductivist approach and the unity of science program associated with logical empiricism that aimed to ultimately define all the terms and concepts of the special sciences in terms of those found in our basic physical theories. NRP, in contrast, accepts what Jerry Fodor called the "autonomy of the special sciences" (Fodor, 1974; 1997). We should not expect the concepts and categories relevant to understanding the aspects of reality studied by the special sciences to be definable in terms of strictly physical theories. One should not use physics to understand economics, even if ontologically every economic event must be physically realized. The patterns and dynamics relevant to understanding economic facts are invariant across a wide range of diverse physical realizations. Our economic concepts need to define the categories that allow us to successfully detect and model those higher-level invariant patterns.

The second part of the dual perspective is teleo-pragmatic functionalism (TPF). Like all versions of functionalism, it treats minds and mental properties as higher-level organizational features of complex systems. Minds are not distinguished by what they are made of but by how they are organized and how they function. There are no special mental substances; creatures with

minds are composed of the same basic physical constituents as non-minded systems. What matters is how they are put together, and what powers and abilities result from that organization. In particular, minded systems are able to acquire and store information and to use that information to successfully guide their behavior to adaptively achieve their goals and enhance their own well-being and survival. Minded systems show complex patterns of *informationally sensitive goal-directed behavior*. The teleo-pragmatic aspect of TPF focuses on that fact. The functional relations that characterize the relevant organizational structures are *teleological* because they are defined in terms of how they contribute to the organism's success in achieving its goals. The relevant notion of information possession is *pragmatic* because it concerns how the organism can use that information to adaptively engage its environment. Such engagement is typically contextual and dependent upon both the causal structure of the environment and the causal structure of the organism. The match between organism and environment provides affordances that allow the organism to successfully navigate and manipulate its world. Thus, from the perspective of TPF, possessing information is not a passive state but a capacity for active engagement that is grounded in practical abilities. TPF views mental representations as cognitive tools that can be used to model and interact with the diverse aspects of reality.

TPF, thus, provides support for NRP and the autonomy of the special sciences. Once we view mental representations as cognitive tools rather than as pictures, it is not surprising that the representations that are effective for engaging particular higher levels aspects of reality, such as economic regularities, cannot be constructed out of the tools that are adaptive in dealing with their lower-level physical substrates; tools do not generally work like that. Which tools and models will be effective at a given level is contextual and depends not just on the causal structure of the world, but also on the causal structure of the cognitive agent, and the engagement between them.

The combination of NRP and TPF allows us to see how and why physicalism can accommodate the existence of physical facts that are subjective in Nagel's sense. Indeed, as we will see, physicalism so understood is not only compatible with subjective facts but implies their existence. Here in brief is an argument for that conclusion based on three key claims.

1. First, we need to specify what counts as a physical fact. TPF like other versions of functionalism interprets the relation between higher-level and lower-level facts in terms of realization, and thus the domain of physical facts can be defined recursively, built up by successive levels of realization from the

base of strictly physical facts, that is, from the facts specified by physics proper. Assuming a general notion of realization, the definition would have a base clause:

(i.) If a fact F is fully specified by physics, then F is a *physical fact.*

And a recursive realization clause:

(ii.) If a fact F* is fully realized by physical facts, then F* is a physical fact.

By applying the recursive clause over and over, the entire domain of physical facts–including chemical facts, biochemical facts, biological facts, psychological facts, social facts–would be generated from the initial strictly physical realization base. A fully detailed proposal would require more precision, but hopefully, the basic idea will suffice for present purposes.

2. The second point to note is that on most versions of functionalism, representational content is determined by functional role, though the specifics vary with particular versions. From the perspective of TPF, the content of a representation used in thought is determined by its overall functional role with a special emphasis on how it enables the organism to successfully engage the relevant part of its world. Thus, an organism's capacity to have and understand a representation with a given content depends in part on how it contributes to the organism's practical abilities. The organism's ability to partition the world into the relevant categories and to understand the nature of those categories is grounded in how its functional organization enables it to directly or indirectly discriminate those features and successfully interact with them. Thus, limits on those practical abilities may prevent the organism from realizing mental states or representations with some related content. In order for a mental representation M to have a particular content C, M must play the relevant functional role R within the organism or system. Many roles can only be defined holistically relative to the larger systemic content S. It may be that M can play R only within an organism or system S that has the requisite practical abilities to engage the relevant part of the world. Thus, according to TPF, whether a given organism can have mental representations with a given content is limited in part by its capacity for practical engagement. And it similarly limits what contents and facts it can understand.

3. The third and crucial step in the argument is the fact that conscious minds are self-understanding systems. This is true in several respects. In one sense, it is an epistemic fact. Reflexive self-awareness is an essential feature of consciousness. We are aware of our conscious thoughts. Indeed, to hold otherwise would seem to require the contradictory existence of unconscious conscious thoughts. We need not explicitly note and categorize all our

conscious thoughts, and our awareness of some of them may be fleeting, but to exist they all must be part of our experience, our stream of consciousness. And that requires that we are in some way aware of them.

There is also a second non-epistemic sense in which conscious minds are self-understanding, a constitutive or ontological sense. Conscious minds are autopoietic systems, that is, dynamic systems that create themselves, maintain themselves, and control themselves (Maturana & Varela, 1972; Lorenz, 1973; Van Gulick, 2003). Thus, the contents of the representations that are deployed in our conscious self-awareness are a function of the roles they play within that internal dynamic process of self-creation. It is in that respect that we can interpret self-understanding in a constitutive sense. From a TPF perspective, the notion of *understanding* in such cases spans the distinction between knowing and being. By understanding itself in a certain way, a conscious mind creates itself. Its existence depends on how it reflexively represents itself and how it causally engages itself. It is in that sense that conscious self-understanding is both *knowing* and *being*, both epistemic and constitutive in a mutually supporting way. Though one should not make too much of etymologies, it is worth noting that the same hidden metaphor informs both the words "understanding" and "substance"–that which *stands beneath*, supports, and in the constitutive sense makes real.

Given the three elements of the argument covered in 1, 2, and 3, it follows that there are facts that are both physical by our recursive definition and subjective in Nagel's sense, facts that can be understood only from a particular experiential point of view. The relevant facts are those associated with the contents of the representations that we use in our conscious self-understanding. Given TPF, those contents are determined and realized by the functional roles those representations play within the dynamic autopoietic organization of our conscious minds, which includes their intra-mental causal engagement. It is impossible to have a representation with equivalent content unless one can deploy it in a similar dynamic context. Unless one shares a similar systemic organization, none of one's representations could fulfill an equivalent functional role, nor possess the relevant content. Thus, the facts determined by those contents are subjective facts. Given the dual nature of self-understanding in conscious minds –both epistemic and constitutive– it follows that one can understand the relevant facts about such conscious minds only by instantiating those facts oneself. Thus, such facts can be understood only from the point of view associated with having such experiences.

Those facts are nonetheless physical by our recursive definition. They

involve very high-level facts realized within complex organizations. They are ultimately realized by the underlying strictly physical structure of each specific organism or system, but they are separated from those base facts by many levels of organization with cross-cutting categories and relations of contextual multiple realizations between them. Thus, for all practical purposes, it is impossible to define those high-level facts using the resources of physical theory, just as NRP would expect to be the case. We can understand them only from the causally embedded internal perspective of our self-understanding. Such facts are both physical and also subjective.

Thus, the existence of subjective facts is not an objection to physicalism. Indeed, it is just the opposite. The combination of non-reductive physicalism and teleo-pragmatic functionalism implies the existence of subjective physical facts. Their existence is entailed by the view once we recognize conscious minds as self-understanding systems. Thus, the existence of such facts provides confirmation of physicalism rather than being an objection.

Moreover, they lend specific support to the NRP/TPF version of physicalism that explains why they are necessary. As a version of physicalism, the combination view is in some ways complete and in other ways incomplete. It is ontologically complete. It asserts that everything real in space and time is ontologically physical, and it spells that out in terms of realization and the recursive definition of physical facts. Explanatorily, it is in some ways incomplete. It accepts limits on what can be reduced or logically defined in strictly physical terms. It acknowledges the existence of subjective facts that we cannot understand. However, at a meta-level, the theory is explanatorily complete because it explains why such limits must exist.

The existence of physical subjective facts also provides a new and direct objection to Frank Jackson's famous knowledge argument against physicalism (Jackson, 1982). Jackson asks us to imagine Mary the super color scientist who knows all the physical facts about color and color perception despite the fact that she has lived all her life in a black-and-white environment and thus has never had a red experience. Jackson argues that when Mary is released from her isolation and for the first time sees a red tomato, she will learn a new fact –she will learn what red looks like. Because she knew all the physical facts about a red experience before her release, the new fact that she learns must be nonphysical, thus refuting physicalism.

The argument has spawned an enormous literature and many replies (Ludlow et al., 2004), but the existence of subjective physical facts provides a new and simple objection: Jackson's imagined case is impossible. In

constructing thought experiments, philosophers have great leeway to stipulate almost anything they choose, but they cannot include contradictory conditions, and that is what Jackson has done. As we have shown above, some of the physical facts about experience, including red experience, are subjective facts. They are physical, but they can be fully understood only from the point of view associated with having such experience. Only from that embedded internal context of causal engagement can one realize the required functional roles and contents. Because Mary has not had any red experiences before her release, it follows that there were subjective physical facts she could not know or understand. Thus, we can simply reject the initial assumption of Jackson's argument; it is impossible for pre-lease Mary to know all the physical facts about a red experience. There are subjective physical facts she could not know.

If one accepts the argument above for the existence of subjective physical facts, then one has a physicalist answer both to Nagel's subjective facts argument and Jackson's knowledge argument. The existence of physical subjective facts undercuts both anti-physicalist arguments. However, the anti-physicalists may deny that the physicalist has made any progress on solving the hard problem, and they may thus argue that the apparent resistance of consciousness to physical explanation still provides powerful support for anti-physicalism. Answering two negative challenges does not in itself provide a positive explanation. We are not yet close to solving the hard problem, but perhaps current theories are making progress. Thus, it may be useful to briefly consider one of the leading scientific theories of consciousness to see whether it has narrowed the explanatory gap. I will also suggest a way to augment that theory that involves a different sense in which facts about consciousness are subjective.

There are many current neuro-psychological theories of consciousness, of which the two most prominent are the Integrated Information Theory or IIT (Tononi, 2008) and the Global Neuronal Workspace theory or GNWS (Dehaene & Naccache, 2000; Dehaene, 2014). The second of those is relatively easy to understand and is plausible in many respects. So, for present purposes, we can take it as our example. Global Workspace Theory aims to explain the difference between conscious and unconscious mental states, for example, conscious and unconscious visual perceptions. Vision researchers can manipulate the stimulus so that it occurs just below or above the threshold for conscious awareness using techniques such as backward masking. If the stimulus is shown for only 50 milliseconds and immediately followed by

another image, subjects will not report seeing the first stimulus; the second stimulus masks it. But indirect measures such as priming effects can show that high-level visual processing of the first stimulus has occurred unconsciously. Visual stimuli can be processed unconsciously not only in terms of basic spatial and geometrical features but also in terms of high-level contents such as object categories, word meanings, and the emotional character of faces.

What then is the difference when those perceptions are conscious? GNWS offers an answer in terms of what it calls the "global workspace", which is a functionally defined system that makes contents broadly available to many subsystems throughout the brain. Information that is selected for inclusion in the workspace is available for use by many modular systems including the language system and various action-planning systems. What matters is the connectivity that the workspace provides. The representation of the conscious visual information remains within the same areas of the visual cortex where they were unconsciously represented. Those same representations become conscious when they become globally accessible through the workspace. Recurrent activation from frontal and parietal areas reinforces and sustains the firing activity of the neural representations that become part of the workspace. That recurrent feedback onto the visual cortex selects the subset of visual contents that become conscious. Without that recurrent processing visual contents rapidly fade and are not globally available. They remain unconscious.

There is a lot of psychological and neural evidence in support of GNWS theory, though it also has its critics. For present purposes, we can focus on one main concern, namely that GNWS theory seems at best to offer an explanation of *access consciousness* but not of *phenomenal consciousness.* Contents that are recruited into the global workspace are available to a wide range of action-controlling systems including those associated with verbal reports, but such functional accessibility in itself does not seem to explain or require phenomenal what-it-is-likeness. As a matter of fact, global access and phenomenal feel may often coincide, but GNWS theory in itself does not explain why that should be. Thus, GNWS theory seems more apt for solving the so-called "easy problems" of consciousness rather than for answering Chalmers' hard problem.

The hard problem is not likely to be solved anytime soon, but incremental progress may be possible. In that spirit, I offer one brief and speculative suggestion for augmenting GNWS that might be of value, a suggestion that turns on another respect in which consciousness is *subjective,* not in Nagel's epistemic sense but in the sense that experiential consciousness always

involves a subject that has the experience. An experience can exist only in so far as there is some subject that has that experience. Pain can exist only if some subject feels that pain, and the same is true of any type of experience. Galen Strawson refers to this as the "subject thesis" (Strawson, 2003). Thus, if we want to explain how some brain state realizes an experience, we need to understand how the larger network of the brain constitutes an experiential subject. We need to have the right relationship to bridge the psycho-physical gap. The larger context is essential. Trying to explain how a local brain state by itself constitutes an experience of red would be as nonsensical as trying to explain how a single coin or banknote has monetary value. The local realization can be understood only in relation to the larger systemic context, and in the case of conscious experiences that context is the experiential subject.

How then does a system such as the brain become a subject in the experiential sense? According to GNWS Theory, the contents that enter the workspace are integrated and unified into a coherent representation of the world. One might go a step further and require that they be integrated *as if from the perspective of a single subject or self*, that is, from the perspective of a *virtual self*. The virtual self is not a real entity existing over and above the integrated representations. Rather it is the point of view implicitly defined by that structure of unified contents. Daniel Dennett introduced the idea of the virtual self as what he called "the center of narrative gravity", the point of view from which the narrative coheres (Dennett, 1992). It is not the author of the narrative, nor an explicit character in the narrative. It is the point of view implicit in the narrative.

With respect to consciousness, the suggestion is that the conscious subject might be understood in terms of a similar virtual entity, the virtual self. When contents are unified and integrated in the requisite way that implicitly defines a subjective point of view, then the conscious self is brought into existence as a virtual structure. It is the subjective viewpoint implicitly defined by that integrated representation. So understood, the conscious self is virtual yet real. It is virtual because its existence constitutionally depends upon the integrated contents that define it. It has no prior independent existence. Nonetheless, it is real. When a system of contents is integrated in a way that defines a virtual self, then that system, as a whole, counts as a real self. There is nothing more to being a real self (Van Gulick, 2022).

Here again, we see another way in which consciousness might be explained as a form of self-understanding including in the constitutive sense. The

representations in a conscious system are integrated as if from the perspective of a single subject, the virtual self. However, by understanding itself in that way, the system becomes a genuine self. Moreover, it is only when that occurs that those representations become experiences. As the subject thesis asserts, there can be no experiences without a subject to have those experiences. Thus, the creation of the conscious self and its experiences is mutual and simultaneous. Neither precedes nor creates the other. Thus, the virtual-self theory differs from both traditional Cartesian conceptions of the substantial self and from bundle theories. On Cartesian accounts, the conscious subject exists prior to any experiences; it exists independently and creates its experiences. On bundle theory views, experiences exist independently and then get collected and linked to constitute a conscious self. This is not the case in the virtual-self theory. There are prior contents that get integrated to define the virtual self, but they are not yet experiences; they become experiences only when they are integrated in a way that defines a virtual self and creates a conscious subject. Experiences cannot exist without a subject to have them. Thus, the virtual-self theory offers a novel way to think about the conscious subject, one that treats experiences and the self that has them as mutually interdependent. Each exists only because of the other. A single process of constitutive self-understanding produces them both together (Van Gulick, 2022).

Much work would have to be done to develop this brief speculative sketch into a worked-out theory, but the virtual-self view offers a promising option for how to construct a conscious subject. Were it successful, it would also take us one step closer to solving the hard problem.

Conflict of Interests

The author has no competing interests.

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