

An Argument for Unconscious Mental Qualities

Sam Coleman

University of Hertfordshire

Conscious mental qualities, aka phenomenal qualities, are seemingly a leading factor in much of our behaviour. Pains make us recoil from painful stimuli, itches make us scratch, feelings of anger sometimes make us shout, visually perceiving red leads us to halt at stop lights, and so on. To relinquish this claim about the efficacy of conscious mental qualities would mean surrendering a major component of our everyday, intuitive self-conception; hence, the claim enjoys considerable prima facie plausibility. Unconscious mental qualities, however, have been posited by a mere handful of philosophers historically, and are nowadays almost universally rejected. Via a case study of 'restless legs syndrome', I argue that there is a hitherto unnoticed cost to this prevailing rejection of unconscious mental qualities: the causal efficacy of conscious mental qualities is threatened. In fact, I argue, we face a dilemma: To endorse epiphenomenalism about conscious mental qualities, or to posit unconscious mental qualities. Since it is so plausible that conscious mental qualities are causally efficacious, this reasoning constitutes an argument for unconscious mental qualities. Moving beyond the sensory case, I explain how analogous reasoning might apply to other mental faculties where phenomenal qualities seem causally involved; notably, emotions and mental imagery.

Keywords: Mental qualities, consciousness, epiphenomenalism, unconscious mentality, restless legs syndrome, sleep.

0. Introduction

Consider some everyday scenarios: Driving, you come to a stoplight, see that it displays red, and halt. Cooking, you allow your elbow to touch the hotplate a moment too long, feel the resulting burning sensation, and rapidly withdraw your arm. Out shopping, you spot a baby blue T-shirt and put it in your basket because you like the colour. Experiencing anger towards your cat for surreptitiously licking your dinner, you shout at her, then feel bad and stroke her. Hearing them shout your name across the crowded room, you wade through the cocktail party to meet your embarrassing date. Some of these examples have

the appearance of deliberate actions, with conventional psychological explanations, and some seem closer to stimulus-response cases. The commonalities I want to highlight among them, nevertheless, are i). the presence of mental qualities, also known as qualia, and ii). the prominent role of these qualities in explaining what one did or how one reacted. On the face of it the relevant mental qualities, combined with other factors, helped to cause or prompt one's activity. One did what one did because of witnessing redness in connection with the stoplight, pain in connection with the hotplate, the overly loud auditory quale of one's name in the cocktail party, etc. Moreover, the quality involved in each of these cases is, as the description makes explicit, *felt*—or, in other words, *phenomenally conscious*. When we have episodes of qualities being conscious in this way we call them *feelings*, or sensations—so a feeling of anger or pain, a sensation of blue, and so on.

It is fair to say everyday life and talk overwhelmingly count conscious mental qualities as a leading source, or contributing factor, in much human (and non-human) activity. Accordingly, there is a strong *prima facie* case for affirming, *outside* everyday life—notably, when theorising about the mind—that conscious mental qualities do indeed play such a prominent role in our activities. Because mental qualities are often positioned between inputs and outputs, common sense ascribes qualities a significant *functional role*: One sees the stoplight's redness, and then, due to seeing this redness, presses the brake pedal. Touching the hotplate leads one to instantiate the burning pain quality, and this feeling prompts withdrawal of one's arm. And so on.

The prevalence of such everyday explanations of human activities provides strong *prima facie* support for the claim that mental qualities have this sort of causal/functional role. What should be noted, additionally, is the great cost and difficulty of rejecting this claim on theoretical grounds—say, because one's favoured metaphysics of mind leaves no space for mental qualitative properties. It is all very well to state, in the seminar room, 'My pain did not literally cause my withdrawing my elbow from the hotplate', but once outside in the real world it is exceedingly hard to live in accord with such a proposition. Regardless of having made such avowals when in the grip of one's theory, one's normal behaviour is bound to belie them: for one *will* strive to keep one's elbows away from hotplates to avoid pain. So, absent the extremely strong contrary evidence that would be

needed to overturn it, the following thesis seems about as certain as any in science and philosophy:¹

Causal Qualities (CQ) Conscious mental qualities (aka feelings) play a significant role in causing/prompting human activity.

But just how crucial is the element of *consciousness* in the causal/functional profile of mental qualities? Must a quality be *felt* in order to play its role in producing activity? According to Michael Lockwood and David Rosenthal, we often find cases where properties that are most likely not conscious play this sort of role. To this extent, they argue, we have reason to posit *unconscious mental qualities*. Rosenthal focuses on abnormal cases derived from a scientific context, but also on more everyday cases, and Lockwood focuses on everyday cases. Rosenthal discusses instances of unconscious perception, as in masked priming and blindsight.² He also mentions the cocktail-party effect as a plausible example, and unconscious pain. Lockwood discusses an Armstrong-style driver, and unconscious anger.³ He brackets blindsight, arguing that it is not perception. But we need not debate whether blindsight is perception. It suffices if some blindsight involves discrimination based on mental qualities, qualities that, given the context, we ought to take as being most likely unconscious.

Ignoring certain small differences between them, the broad form of what I'll call the 'Lockwood-Rosenthal argument' for unconscious qualities⁴ is as follows.⁵ The argument

¹ Some do embrace epiphenomenalism. But this embrace, notably, is the result of theorizing: epiphenomenalism never features as a plausible *starting point*. For example, Jackson (1982) feels forced to epiphenomenalism (a position he has since renounced) because of his knowledge argument against physicalism. Other philosophers embrace it to escape the 'causal argument' for physicalism. Note epiphenomenalism's association with attempts to evade physicalism. The locus classicus is Chalmers's (1996) *zombies*, central to his anti-physicalist 'zombie argument'—creatures supposedly functionally identical to us despite lacking feelings of any kind. Since it is a resort philosophers are driven to only as a consequence of, or in order to defend, their theories, epiphenomenalism thus plausibly *seems false*, at least *prima facie*. See further §4.

² Rosenthal 2010.

³ Lockwood 1989.

⁴ Rosenthal uses the terminology of 'mental qualities', so argues for unconscious mental qualities. Lockwood talks of 'phenomenal qualities', arguing that phenomenal qualities outrun consciousness/awareness. But 'phenomenal' arguably connotes awareness/consciousness, making Lockwood's terminology infelicitous. Sometimes, though, he also employs the term 'qualities'. I combine these policies, talking mainly in terms of *mental qualities*, and abbreviating this to *qualities*.

⁵ See Lockwood 1989: 165-6, Rosenthal *op. cit.*

starts from a premise that embeds CQ, the claim that conscious mental qualities play a significant functional role in human activity:

P1. If there are unconscious properties that play the same functional roles as conscious qualities do, then they are unconscious qualities.

P2. There are unconscious properties that play the same functional roles as conscious qualities do.

So, there are unconscious qualities.

The Lockwood-Rosenthal argument thus leverages the apparent causal/functional role of conscious mental qualities into an argument for unconscious qualities, on the basis that there are unconscious properties with the same functional profiles. The suggestion is that if these unconscious properties make the same sorts of contribution, causally, in respect of human activity, as properties that are avowedly qualitative—viz. conscious mental qualities—then the unconscious properties are themselves qualitative, hence are unconscious mental qualities. Rosenthal stresses the functional role of ‘perceptual qualities’ as essential to them, rejecting an approach whereby the conscious appearance of such qualities, how they are experienced, is instead held to exhaust them. On his conception, there will be strong grounds for positing unconscious perceptual qualities if properties with the same functional role can be found that are most likely unconscious. Lockwood argues that for unconscious anger to explain behaviour in the way conscious anger does, it must preserve the qualitative character of anger.

Lockwood and Rosenthal must make this argument because of widespread resistance to the suggestion that qualities could exist unconsciously. Indeed the claim that they could, or that feelings could exist unfelt, and other similar claims, are widely judged to be obviously false, even incoherent. My goal is not to assess this sort of rejection of unconscious qualities,⁶ but I will mention a few factors that motivate it, to give readers a sense of the issues, and to make clear the kind of opposition the proponent of unconscious mental qualities must overcome.

First, terms such as ‘qualia’ are often defined with reference to consciousness, or used in ways that equate to or imply consciousness. For example, David Chalmers’s philosophical

⁶ Though see Coleman 2022a.

zombies are often described as lacking *qualia* (despite being our physical duplicates), and this is universally read as meaning they lack consciousness. I am for various reasons reluctant to relinquish ‘qualia’ to those who hold qualia are by definition essentially conscious. But since it is only a term, for everyone’s convenience I will talk instead of ‘mental qualities’ or ‘qualities’ for short. It is then a substantive issue whether mental qualities we experience can also exist unconsciously.

A second motivation is the observation that mental qualities figure in the appearances of things to us—of our bodies, perceptible objects, our mental states, and so on. And then the claim is that these appearance properties could not figure unconsciously, since there are no unconscious appearances. We need not insist that unconscious appearances are intelligible.⁷ But even so, it might be that the salient properties *in virtue of which* there are appearances to consciousness can persist unconsciously—and these could have the very qualitative natures that are ‘disclosed’⁸ to consciousness when they are experienced.

A third motivation is that qualities are the (perhaps intrinsic⁹) properties in virtue of which conscious states resemble and differ.¹⁰ That is true, but why should not those resemblances and differences persist when consciousness is not there to witness the comparison?

Lastly, many intuit that qualities are modifications of consciousness—ways of being conscious. But that claim, without further support, begs the question against those who think qualities are not modifications of consciousness. Second, the claim is too weak, for it needs to be ruled out, additionally, that qualities can also modify *unconsciousness*. I do not wish to get further bogged down in this debate, however; I want to push on to my positive argument for unconscious qualities. This was by way of scene-setting, for the reader’s orientation.

Given the strength of resistance, as Lockwood and Rosenthal note, opponents are prone to dig in their heels and simply *insist* against positing unconscious qualities.¹¹ Regarding

⁷ As Bertrand Russell occasionally does.

⁸ Lockwood’s term, *Op. Cit.*

⁹ Qualitative states can also resemble extrinsically, e.g. as regards timing, but this does not seem relevant. See further Coleman 2022b.

¹⁰ Siewert 1998.

¹¹ Strawson (1994: 170) explicitly makes such an insistence.

the Lockwood-Rosenthal argument, the obvious place to attack is premise one: Opponents can, and do, deny that if we find unconscious properties that do what conscious qualities do,¹² then these are unconscious qualities. The defender of unconscious qualities is in a tight spot, since, unlike conscious qualities, direct introspective evidence for unconscious qualities is lacking. Whatever evidence we adduce must be indirect; we must offer such things as abductive arguments to establish their existence. What I intend to do is to take the Lockwood-Rosenthal (L-R) style of argument a step further, to heap greater pressure on the person who rejects unconscious qualities in the way just described, i.e. by rejecting premise one of the L-R argument. To be clear, what that opponent claims in reply to the argument is that *there are unconscious properties that, though they are not mental qualities, do exactly the job we would expect mental qualities to do were they unconscious*. I will argue that this claim comes at a cost, and it is unacceptably high. Therefore, on balance, we should accept premise one, and with it the L-R argument: we should posit unconscious qualities.

My goal, then, is to bolster the L-R argument by arguing that the consequences of rejecting its premises and conclusion are more unpalatable than those attached to accepting them.

Things proceed as follows. My argument builds on a case-study of a medical condition known as ‘restless legs syndrome’ (RLS). So §1 explains RLS, before I employ it in my main argument in §2. The argument is that rejection of premise one of the L-R argument for unconscious qualities leads to epiphenomenalism about conscious qualities—specifically, in the context of RLS, certain sensory qualities. §3 examines and rejects some objections to the argument, before considering an extension of it beyond sensory states, notably to emotional states and mental imagery. §4 concludes, by weighing up the dilemma between endorsing epiphenomenalism about conscious qualities and positing unconscious qualities. A coda, §5, considers the objection that my argument threatens to make consciousness itself epiphenomenal, and that this is an unacceptable consequence.

1. Restless Legs Syndrome

¹² Minus, of course, whatever contribution their simply *being conscious* makes to their functionality. Perhaps consciousness enables a kind of executive control; then unconscious qualities will not enable such control and we will not seek it in trying to isolate unconscious properties with the causal/functional profiles of conscious qualities. I bracket this point below, but return to it in §5.

RLS is suffered by roughly 10% of the Western adult population (and about half that in Asia), and correlates with ageing. The sufferer compulsively feels an overwhelming urge to move one or both legs in response to a growing sensation of discomfort in the leg—often likened to a ‘creeping crawling’ feeling, or ‘tingling’¹³; a sensation reportedly between an itch and a pain, though with aspects of both. On moving the leg, say by flexing or stretching it, or walking around, the horrible sensation is partially or wholly relieved, but builds up again, prompting further relieving movements. This pattern of the build-up of the feeling and the periodic leg movements (PLMs) to relieve it continues day and night, though is standardly somewhat worse in sufferers at night.

One interesting thing about RLS is that the feeling actually makes it into the medical criteria for diagnosing the condition.¹⁴ The criteria agreed between the International Restless Legs Syndrome Study Group (IRLSSG) and the US National Institutes of Health (NIH) are as follows, and all four symptoms must be present for a RLS diagnosis:

- (1) An urge to move the legs which is usually accompanied or caused by uncomfortable and unpleasant sensations in the legs;
- (2) The urge to move or the unpleasant sensations begin or worsen during periods of rest or inactivity, such as when lying down or sitting;
- (3) The urge to move or the unpleasant sensations are partially or totally relieved by movement, such as walking or stretching, as long as the activity continues;
- (4) The urge to move or the unpleasant sensations are worse in the evening or at night than during the day or only occur in the evening or at night.

Note that the movement or urge to move the legs is attributed to—said to be caused by—the feeling.¹⁵ Of further interest is the fact that the condition and consequent movements

¹³ Trenkwalder et al. 2005, Chaudhuri et al. 2001: 144.

¹⁴ Bucher et al. 1997: 639; Suzuki et al. 2015: 2.

¹⁵ Someone may wish to stress the ‘accompanied by’, at the expense of the ‘caused by’, hoping to block my argument below. But, first, the criteria make clear that the sensation is a cause of the movement or urge to move, even if it is sometimes just an accompaniment (though even if the urge is accompanied by the feeling we might still take it, together with the urge, to help cause the movement). Second, we presumably do not want to go the route of framing feelings as mere accompaniments as a general policy—compare, for example: ‘The burning pain I felt on touching the hotplate was accompanied by an urge to remove my arm and followed by my pulling my arm away’. That is, not if the aim of such descriptions is to avoid saying feelings ever cause things, as this way we will already have reached the counterintuitive territory of epiphenomenalism. And

continue throughout the night, during sleep, including dreamless sleep,¹⁶ when the sufferer is presumably wholly unconscious—that is, not in possession of any conscious mental states. Periodic leg movements during waking are called PLMWs, and those that occur during sleep are PLMSs—they are distinguished only by the condition of the RLS sufferer. PLMSs can wake the sufferer,¹⁷ and sometimes arousal precedes leg movement; but often sleeping leg movements seem to be prompted from a state of dreamless sleep.

Now a little about the neurophysiology. Noteworthy here, first, is the fact that neuroscientists researching the basis of RLS make the assumption, one that is taken so much for granted that it goes practically unstated in the literature, that a *single* brain condition, or circuit, is involved day and night, in waking and sleeping; i.e. that we have one continuous phenomenon in play whether the sufferer is prompted to move their legs in a state of consciousness or unconsciousness.¹⁸

The precise neurophysiological basis of RLS remains a topic of intense research, and proposals at this stage have a somewhat hypothetical character. But let me briefly present some aspects of what seems to be the most popular kind of theory emerging from the literature. It should be noted that the hypothesis derives from a variety of evidence sources, functional MRI scans, PET scans, sleep studies, questionnaires, patient testimony, etc.

RLS sufferers show chemical and structural changes to the brain, including especially iron and dopamine deficiencies, affecting the sensorimotor cortex and surrounding systems, the thalamus, the limbic-nociceptive system, and there is, importantly, evidence of structural change to the anterior cingulate cortex (ACC) as well. The working hypothesis

to maintain that *only* RLS-associated feelings are mere accompaniments, but pains felt on burning one's hand, etc., are not, would be ad hoc. In any case, abundant testimony from RLS sufferers cites the feeling as the cause or prompt of their relieving movements.

¹⁶ RLS symptoms occur at all stages of sleep, so assuming there is some dreamless sleep they occur during it too, and indeed if anything symptoms are *more* prevalent in non-REM sleep (Manconi et al. 2007).

¹⁷ Though this is atypical—see Bogan 2006: 515; Ferri et al. 2017: 30.

¹⁸ This assumption manifests in i). the way researchers discuss, or study, the mechanisms of RLS in connection with waking and sleeping conditions under one head, and ii). the conspicuous absence of any attempt to specify significantly different circuits for waking and sleeping (aside from minor differences, e.g. in dopamine levels). See Bucher et al. *Ibid.*, p.640; Rizzo et al. 2017: 45-6; Margariti et al. 2011: 1; Winkelman et al. 2014; Chaudhuri et al. *Ibid.*, p.144; Ferri et al. *op. cit.* The assumption is particularly near the surface in Salas et al. 2018, who talk for example of finding 'a neurobiological basis' for RLS, i.e. for waking and sleeping PLMs alike (p.110).

is of a hyper-sensitivity to sensory stimuli, and/or a breakdown or degrading of circuits involved in tolerance of sensation or inhibition of response, or increased motor excitability, plausibly as a result of the aforementioned iron deficiency.¹⁹ There may also be a genetic component or predisposition. To spell out some plausible implications of the neuroscientific account: the involvement of sensory-motor cortical areas, plus thalamus and frontal areas like ACC, shows convincingly that ‘higher’ cognitive functions are involved; this is not a mere reflex running through the brainstem or lower mammalian areas (as an early hypothesis regarding RLS’s basis had it). Movements are voluntary and very plausibly in response to felt sensations, as the roles of the thalamus, a sort of switchboard for the processing of sensory information, and ACC, involved in the negative affective aspects of pain and also implicated in decision-making around movement, not to mention sensory-motor cortical areas, indicate. In short, everything observed on the neurophysiological front seems to bear out the testimony and experience of patients: the build-up of the creeping crawling feeling eventually culminates in an overwhelming urge to move the limbs in order to relieve it.

Let me recap the noteworthy features of RLS in preparation for the argument of §2:

1. The feelings, these creeping crawling qualities, make it into the essential diagnostic criteria for RLS.
2. The feeling causes the urge to move or the movement, which is undertaken to relieve the feeling.
3. The PLMs characteristic of RLS go on day and night, in waking and sleeping, including during dreamless sleep.
4. A single neurophysiological basis of RLS is the working assumption—i.e. RLS is construed as a single continuous phenomenon whether the sufferer is awake and conscious or dreamlessly asleep and unconscious.

Next to the argument for unconscious qualities.

2. Restless Legs Syndrome and Unconscious Qualities

¹⁹ Salas et al. *op. cit.*; Lanza et al. 2017; Lee et al. 2018; Bucher et al. *op. cit.*

It is straightforward to plug RLS into a L-R style argument for unconscious qualities. Adapting the generic version of the argument to employ RLS-associated feelings as a specific instance, that argument would go like this:

P1. If there are unconscious properties that play the same functional role in RLS as conscious creeping crawling qualities (i.e. the properties that cause PLMWs in waking life), then they are unconscious creeping crawling qualities.

P2. There are unconscious properties that play the same functional role in RLS as conscious creeping crawling qualities (i.e. the properties that cause PLMSs in dreamless sleep).

So, there are unconscious creeping crawling qualities associated with RLS (hence there are unconscious mental qualities).

Again, as with the generic L-R argument, this argument begins from a premise that builds in the causal/functional importance of conscious mental qualities—in this case, the creeping crawling qualities which cause waking PLMs, i.e. an instance of CQ. From the fact that there are properties that play the same functional role—producing PLMSs—when the subject is wholly unconscious, the argument infers that there are unconscious creeping crawling qualities.

As mentioned, this argument will meet resistance, which will tend to focus on denying premise one. The objector rejects the consequent of the P1 conditional, thus holds that the conditional as a whole is false.²⁰ What this objector says, effectively, is that despite the physical basis of RLS being the same whether the sufferer is conscious or not, and despite the fact that when the sufferer is conscious the quality causes the movement, nevertheless when the sufferer is unconscious no quality is present to cause the movement. Thus, the objector's hypothesis goes, the (quality-free) physical brain condition of the sufferer is, when that person is unconsciously asleep, the sole sufficient basis or cause of their PLMSs. To spell out their position fully: There is a physical brain condition that suffices to cause PLMs when the subject is unconscious, and when the

²⁰ Denying premise two would contradict the empirical evidence around RLS, which appears harder to do. What the objector seeks to do is grant the empirical evidence and 'lived experience' concerning RLS, especially the causal role of the conscious creeping crawling qualities, while blocking the inference to unconscious qualities. Cf. Searle 1992 ch.7; Crane 1998: 236; Strawson *op. cit.*

subject is conscious and is prompted to move their leg that physical condition is present but is also, and only in this case, accompanied by a creeping crawling quality. So there is no unconscious quality associated with RLS. Now, this is clearly a *coherent* position to adopt. But I will argue that it comes at too great a cost, since it seems to imply that the conscious creeping crawling feeling is epiphenomenal with respect to PLMs.

Here is the intuitive idea of my response to the objector. By scientific hypothesis a single neurophysiological mechanism subserves RLS and its PLMs, whenever they occur. The objector says this mechanism, but no qualities, realises RLS during dreamless sleep and causes the PLMs. But if that mechanism suffices for the movements in the absence of qualities, then it suffices for the movements by itself in the waking case also (just as a brick will break a window no matter what colour we paint it). Therefore, the qualities present in the waking case have no causal contribution left to make, and are rendered epiphenomenal. This reasoning resembles a ‘causal exclusion argument’ in the philosophy of mind, associated with Jaegwon Kim.²¹ Kim’s solution to his version of this conundrum is to *identify* mental qualities with the relevant neural bases. That move is unavailable to objectors to the L-R argument because it entails the existence of unconscious qualities, given the presence of the neural basis during dreamless sleep. The other option facing Kim, and our objector with him, is epiphenomenalism about conscious qualities, i.e. sensations and feelings.

Let me set out this reasoning more formally:

P1. A single neural basis of RLS/PLMs is in effect in waking and dreamless sleeping.
(scientific hypothesis)

P2. During dreamless sleep the subject and her mental states are unconscious.

P3. A single neural basis of RLS/PLMs is in effect whether the subject is conscious or unconscious. (P1 + P2)

P4. If a single neural basis of RLS/PLMs is in effect whether the subject is conscious or unconscious, then that neural basis suffices, simpliciter, for RLS/PLMs.

P5. The single neural basis of RLS/PLMs suffices, simpliciter, for RLS/PLMs. (P3 + P4)

²¹ Kim 1993.

P6. The single neural basis of RLS/PLMs does not include mental qualities. (objector's hypothesis)²²

P7. A quality-free neural basis suffices, simpliciter, for RLS/PLMs. (P5 + P6)

P8. If a quality-free neural basis suffices, simpliciter, for RLS/PLMs, then there is no causal work left for mental qualities not included in this basis to do, and any such qualities are epiphenomenal. (causal exclusion principle)

So: The conscious creeping crawling qualities present during waking cases of RLS do not cause/contribute to provoking PLMs. With respect to RLS, therefore, conscious creeping crawling qualities are epiphenomenal. (P7 + P8)²³

What the argument establishes is the falsity of CQ, as it is exemplified by RLS creeping crawling qualities, at least. As against the international diagnostic criteria for RLS, a mountain of patient testimony, and an entire scientific research programme, this argument has it that conscious creeping crawling qualities do not causally/functionally contribute to waking PLMs.

The key premise is P6—the objector to the RLS-based L-R argument's insistence that there are no unconscious creeping crawling qualities associated with the neural basis of RLS, which prompts the subject's PLMSs when she is wholly unconscious. Since that same, allegedly quality-free, neural basis is present in waking cases, it causally excludes the creeping crawling qualities that, according to CQ, help cause waking PLMs. So what the argument shows is that the objector's hypothesis, used to reject P1 of the L-R argument for unconscious qualities, entails that conscious mental qualities are epiphenomenal. Hence, as claimed in §1, we face a dilemma between positing unconscious mental qualities and endorsing epiphenomenalism about conscious mental qualities, at least in the case of RLS. This choice turns on rejecting or accepting P6, in effect.

Next I consider some replies to the argument, which I argue fail. That leaves us to choose between conscious quality epiphenomenalism and positing unconscious qualities, a choice evaluated in §4.

²² P6 follows from P3 plus the objector's denial that unconscious mental qualities exist.

²³ Rosenthal (2022: 254) briefly suggests related reasoning, concerning perceptual qualities.

3. Objections

I consider four replies to the argument:

A. Waking and sleeping brains are so different that we cannot really compare the two or make inferences about the causation of a phenomenon that occurs under both conditions.

There is in neuroscience and philosophy of cognitive science the important notion of a *core neural basis* or *condition*. When scientists say *this* is the pain area, for example, or *that* is the area where speech activity happens, or this is the visual processing area, of course they do not mean to imply that, were your occipital lobe removed from the brain and kept alive, it would still have visual experience, say.²⁴ Rather, all specific brain activity, relevant to various defined mental functions, occurs against a backdrop of an active rest of the brain, and we can be pretty sure that the activity discovered to be most pertinent to the function, i.e. that which varies with the function even while the rest of the brain activity is more or less constant, or which shows salient changes as the function varies, could not support the function without the rest of the brain. What I just termed the ‘activity most pertinent to the function’ is the core neural basis. So, the objection to the argument here is that, despite the hypothesis of a single core neural basis to RLS and PLMs in consciousness and unconsciousness, nonetheless when the RLS sufferer is asleep the brain’s background activity is so different to the waking situation that we cannot infer much about the causal basis of PLMSs compared to PLMWs, certainly not enough to conclude that waking creeping crawling qualities are causally excluded. Perhaps, then, my argument is a bit like saying that since a water pistol does not work very well on the Moon, it cannot function on Earth either.

I think this objection boils down to the following idea: that whatever the conscious quality does in respect of causing PLMWs is taken over, during sleep, by the brain *outside* the core neural basis, so as to cause PLMSs, while the contribution of the core neural basis itself remains constant across the cases. This looks to provide a way to safeguard the conscious quality’s causal relevance while avoiding positing an unconscious counterpart quality in dreamless sleep.

²⁴ Cf. Block 2008: 290.

Now, I should stress that my whole discussion takes place against the backdrop of an assumed physicalism, i.e., in this context, the thesis that the brain is all there is to it and any mental qualities are not something non-physical. For if RLS-associated mental qualities are non-physical, not included in the body-brain system, independent problems arise about their causal efficacy—this is the issue Kim addresses, in effect.

So, what the objection comes to is the suggestion that there is a *different* total physical basis for the PLMWs compared to that subserving the PLMSs: the core neural condition plus the mental quality, a supplementary bit of brain activity, during waking, and the core condition plus some other, *quality-free*, brain supplement in the unconscious case. But then this objection amounts to denying P1, the scientific hypothesis that RLS is a univocal physical condition. In fact, we really lose the idea of a constant core neural basis for RLS/PLMs *at all*, on this suggestion, since there is no neural basis in common between waking and sleeping that correlates with the appearance of RLS and PLMs. Rather, there is now said to be a disjunctive basis, a certain neural condition plus whatever the physical realisation of the creeping crawling quality is, in one case (waking), and that condition plus some other quality-free brain activity in the other condition (unconsciousness). So this objection is effectively a denial that, as regards neurophysiology, there really is a single coherent phenomenon in play night and day when it comes to RLS/PLMs. But this is a foundational hypothesis of the scientific research program into RLS—it is what all research, all measurements, experiments, etc. are premised upon.²⁵ I think if it came to a choice between abandoning this hypothesis and saying unconscious creeping crawling feelings prompt PLMSs, scientists would overwhelmingly choose the latter option. Some researchers, perhaps inadvertently, already talk in terms that imply that possibility.²⁶ Indeed, we can see that, strictly, if unconscious episodes of RLS are even to count according to the international criteria drawn up by physicians and researchers, then they must involve a feeling—hence unconscious mental qualities—anyway.²⁷ So objection A has a distinctly ad hoc feel, requiring as it does that we jettison an established, decades-

²⁵ See note 18.

²⁶ See e.g. Bogan *Ibid.*, p.518; Clemens et al. 2006.

²⁷ I do not depend on this point; I am comparing likely attitudes among RLS researchers to a choice between abandoning RLS as a univocal phenomenon, and embracing unconscious creeping crawling qualities.

spanning, scientific research program for the sake of philosophers' qualms about unconscious qualities. I therefore reject it.

B. During consciousness the creeping crawling qualities do causal work that is done exclusively by the quality-free core neural basis during unconsciousness.

The suggestion here is that whatever causal work the creeping crawling quality does during waking is taken up by the core brain activity during sleep. The idea must be that the core neural condition indeed suffices for RLS/PLMs, but, uniquely during consciousness, the creeping crawling quality, another physical phenomenon, 'butts in' or inserts itself into the causal process and asserts itself in causation of PLMWs. The suggestion might be somewhat like this: I can carry the table perfectly well by myself, and indeed am doing so until you come along, grab a corner, and force your assistance on me. Again, this objection has the initial appearance of giving the waking quality a job to do that it need not be around to do during dreamless sleep/unconsciousness.

But again I think appearances are deceptive. Either the core neural condition, the creeping crawling quality aside, suffices for RLS and the PLMs, or it does not. If it does so suffice, as is hypothesised by the present objector to be the case during unconsciousness, then we must ask why it does not also suffice during waking—after all, as per the analogy, I *can* and do carry the table by myself. The quale 'butts in' it is said, in the conscious case, as you intrude and seize a corner of the table. But if you do that, evidently I do not now do exactly the same as I did before—my 'physical activity' is significantly different once you are contributing to carrying the table: I am carrying less load, need not strain so hard, adjust my stance, gait, and grip on the table, to accommodate yours, etc. If I carried on doing *exactly what I was doing* before you grabbed the table it stands to reason that there would be nothing for you to contribute to carrying it: your causal contribution would indeed be screened off. You would be epiphenomenal, even if we made a show of carrying it together (as when children 'help you' carry heavy things).

Analogously, then, it is not the case that the core neural basis can be significantly unaltered *and* fully exerting itself, as it is hypothesised to be during unconsciousness, once the quality intrudes during consciousness, as objection B requires. Rather, its activity must be changed, and significantly so, by the intervention of the conscious

quality,²⁸ if there is to be anything relevant for that quality to do as regards causing the waking PLMs. Hence the core neural condition is not in fact constant between waking and sleeping, for this objector: to repeat, if it were constant then the conscious quality would be causally screened off, as you would be by my constant table-lifting. So again we have ended up disregarding the scientific working hypothesis about RLS, that it has a univocal physical basis, an option we already ruled out as ad hoc. Really, these first two objections come to the same idea, just with the causal contribution of the conscious quality purportedly being picked up in unconsciousness by the core neural condition, or by the brain apart from it; neither option works: both violate P1 and the scientific consensus about RLS's univocal basis.

C. During consciousness, the creeping crawling qualities overdetermine the causal work of the core neural basis.

Overdetermination is where there are two independent, sufficient causes for an effect, as when you keep your pants up using a belt and braces, a student fails the exam and fails on attendance, or an unlucky soul loses a date from over-shyness and halitosis. The idea here will be that the core neural basis indeed suffices for RLS and the PLMSs, and during waking the creeping crawling quality is, additionally, present and does causal work that partly or wholly duplicates the efficacy of the core neural condition, which is still active of course. So, as a result, the conscious quality is not, it seems, epiphenomenal but neither do we need an unconscious quality for the PLMSs of dreamless sleep.

There are various problems with this suggestion. First, in the context of arguments about mental causation, systematic overdetermination is standardly ruled out as implausible.²⁹ It is just improbable that nature works this way; and, indeed, many have the intuition that there are few, if any, real-life instances of overdetermination—if two causes really would suffice for an effect, the likelihood is one cause arrived just ahead and did the job (one failed on attendance before the exam, though one did not receive one's fail grade till afterwards; the belt is supporting your pants and the braces are backup, or both are doing some but not all of the work, even if they could, etc.). Second problem: overdetermination as concerns the causal argument for physicalism entails, in fact is a way of safeguarding,

²⁸ The (conscious) quality is by hypothesis another element of physical brain activity, recall.

²⁹ E.g. when discussing the causal argument for physicalism (Papineau 2002).

dualism. For us, in the present discussion, the way to avoid dualism is to say the mental quality is an (overdetermining) additional element of physical brain activity, outside RLS's core basis. But that is back to denying a univocal brain-basis for RLS (i.e. P1), an option we have twice rejected.³⁰ Third, we would have to ask why nature had bothered to engineer us with mental qualities, surely an expensive addition to the organism, if the brain can get by perfectly adequately without them (as it is hypothesised to do during unconsciousness here). To put it another way, if mental qualities indeed play a causal role in human behaviour—as, following CQ, they seem to—that role would seem to have to be distinctive, and not merely duplicating what other bits of the brain can do without qualities.

D. The creeping crawling mental quality is part of the core neurological process causally responsible for RLS/PLMs. Nonetheless, that aspect of the neurological process does not 'manifest' as a quality when the subject is unconsciously asleep.

The suggestion here is that there is a physical aspect of the core basis of RLS that, when the subject is awake, manifests as a mental quality and, when they are unconscious, does not so manifest. This seems to be a way to say that the conscious quality has efficacy, while rejecting any unconscious qualities, *and* of preserving the posit of a univocal core basis to RLS. So it is a clever objection that needs addressing.

In response, it is clear, on this hypothesis, that when the subject is awake there is more to the creeping crawling quality's instantiation than is included in RLS's core neural basis. Otherwise, if that basis sufficed for the creeping crawling quality simpliciter, that quality would have to be present when the subject was unconscious too, whenever they underwent an RLS/PLMS episode, which by hypothesis on this objection it is not. What else, then, goes into the constitution of the (conscious) creeping crawling quality when the subject is awake? The natural proposal is some kind of brain activity outside RLS's core basis—for instance, a variety of higher-order representation.³¹ What would result is something akin to the perceptual view of consciousness held by Freud, who believed that in consciousness we innerly-perceive the brain as instantiating mental qualities. But the qualities themselves, the *perception* of the brain in this qualitative manner, lie strictly

³⁰ One could, alternatively, identify the mental quality with part of the core neural condition, ushering in unconscious mental qualities.

³¹ See, e.g., Rosenthal 2010, Lycan 1996.

outside the core brain phenomenon that is the *object* of inner perception, in this case the core basis of RLS. Mental qualities are framed as the inner-perceptual *mode of representation* of quality-free brain events, in effect.

Freud, on a plausible interpretation, held that the mental quality—the content of the inner-perceiving of the brain—was epiphenomenal; he was a parallelist.³² Similar trouble afflicts this objection. Specifically, it faces the following dilemma: Either RLS's core basis, what is present during sleeping and waking alike, is the sufficient cause of all PLMs, or it is not. If it is not, so that in the waking case the conscious quality, partly constituted by brain activity outside the core neural basis, is necessary to the causation of PLMWs, then it follows that RLS/PLMs is not after all a unitary phenomenon. Waking RLS takes a different form to unconscious RLS: It features significantly different brain activity as the causal basis of PLMs, given the addition of the creeping crawling quality. So taken this way objection D clashes with P1 of the argument, and we can reject it on grounds of being ad hoc, as we have similar proposals above. On the other horn, the core neural basis of RLS *is* causally sufficient for the PLMs—and, most importantly, for PLMWs. But then, since the core neural basis does *not* comprise the mental quality—as shown by the fact that additional brain activity is needed for the creeping crawling quality to be instantiated in the waking case; the point of this objection is to keep mental qualities as exclusively conscious, recall—the conscious creeping crawling quality is causally redundant. What causes the PLMWs is the core neural condition by itself—what can exist in unconsciousness and consciousness alike—and not the extraneous, quality-constituting, inner-perception or consciousness of it, as provided by the additional brain activity. In sum, either the univocity of the RLS phenomenon is broken, an option we have rejected, or the conscious creeping crawling quality indeed ends up epiphenomenal, as per the argument.

I think we can infer the following from discussion of the objections: assuming scientists are correct that RLS is a univocal physical condition, then on balance the argument stands, and we must choose between epiphenomenal conscious creeping crawling qualities, or rejecting P6 and positing unconscious creeping crawling qualities.

³² Wakefield 2018.

Before weighing up this dilemma, an important question is whether its structure generalises to other kinds of mental qualities, or whether we are limited to the claim that *for RLS-related mental qualities* either they occur unconsciously or their conscious instances are epiphenomenal. It would be significant to establish a dilemma between unconsciousness existence and epiphenomenalism for *any* set of mental qualities, to be sure. But evidently if the problem generalises the significance of the dilemmatic result is greatly increased.

The answer is that the dilemma likely generalises. It will extend to any case where a mental phenomenon: i). occurs consciously and unconsciously, ii). has a relevantly univocal physical basis iii). features mental qualities when conscious. In such cases, denial of unconscious mental qualities threatens epiphenomenalism about the relevant conscious mental qualities. Such phenomena plausibly include perception, emotions, mental imagery, pain, and, on some views, thought and inference.³³ For reasons of space I will briefly consider, for illustration, how the dilemma applies to emotions and mental imagery.

Jesse Prinz models emotions as inner perceptions of bodily disturbances.³⁴ When conscious, these perceptions are feelings, he claims. Thus, conscious anger may be identified with sensations of heightened heart rate, tension in throat and chest, knitting of brows, clenched teeth, or fists, and so on. But Prinz also posits unconscious emotions, and denies that these consist in unconscious feelings, or, in our terms, unconscious mental qualities. Prinz has good reason to posit unconscious emotions, as they have long been viewed as explanatory of behaviour in much the way conscious emotions are taken to be. So far, note, Prinz endorses instances of claims i and iii above, regarding emotions. Moreover, he asserts explicitly that conscious emotional phenomenology is significant in prompting the subject's actions—e.g. punching a pillow out of anger. The question, then, is whether Prinz also endorses the relevant instance of claim ii: does he hold that conscious and unconscious emotions share a physical basis? Indeed he does: as per his 'AIR' theory of consciousness, he suggests that, as with the (in his view) closely related case of outer perception, emotional states exist at the level of 'intermediate brain representations' (in this case of the body), which become conscious by virtue of attention

³³ For a consonant account of conscious and unconscious thought, see Coleman 2021.

³⁴ Prinz 2005.

being directed upon them. Crucially, a given emotion is to be identified with this inner-perceptual physical state, the intermediate representation of the bodily condition, *whether that state is conscious or unconscious*. Thus Prinz's account of emotions faces structurally the same dilemma the opponent of unconscious qualities faces regarding RLS: Either conscious emotional phenomenology is causally irrelevant to the production of emotional behaviour, or unconscious instantiations of emotions feature unconscious emotional qualities.³⁵ Since Prinz identifies conscious emotions with the relevant feelings, this dilemma is pressing: if the phenomenology is causally irrelevant, the conscious emotion *itself* is rendered epiphenomenal.

Bence Nanay analyses mental imagery as a perception-like mental state that does not issue (or not in standard ways) from the relevant bodily senses: e.g. a visual mental image is a conscious state akin to a visual percept except not issuing in standard ways, or at all, from the eyes.³⁶ Moreover, he argues that mental imagery shares core mechanisms with perception: visual mental imagery involves, in particular, activity in V1 closely analogous to the brain states characteristic of visual perception. Moreover, he accepts that, at least in common cases, conscious mental imagery involves 'phenomenology'—e.g. visualising an apple is a case of mental imagery. We can see Nanay endorses instances of claims ii and iii for mental imagery. The question, then, is whether he thinks there is unconscious mental imagery, as per claim i. Not only does he affirm that there is unconscious mental imagery, but he explicitly claims unconscious imagery involves no phenomenology, and that it has the same basis in neural processing as conscious imagery. So the ingredients of the puzzle are all present: It seems that the phenomenology of conscious imagery has effects, e.g. visualising an apple may lead me to purchase a specific kind of apple in the supermarket (one resembling my image, say).³⁷ Yet if this mental image is identified with neural processing that can also occur unconsciously, and when it does so lacks mental qualities, and presuming—with Nanay—that unconscious mental imagery similarly

³⁵ Cf. Lockwood's argument that unconscious anger must 'retain its phenomenal character' (1989: 166-7); see also Coleman forthcoming.

³⁶ Nanay 2018. Cf. Pearson et al. 2015.

³⁷ See Kosslyn et al. 1995 on the functions of imagery.

affects behaviour, the causal role of conscious mental qualities accruing to conscious imagery is undermined, as per the dilemma we set up regarding RLS.³⁸

There is reason, therefore, to think the dilemma concerning RLS will generalise, and quite widely, given that accounts with the same essential structure as those given by Prinz and Nanay are common treatments of conscious mental phenomena with unconscious manifestations. For accounts with this structure, there will be pressure to posit unconscious mental qualities or else to embrace epiphenomenalism about conscious qualities.

4. Is Epiphenomenalism about Conscious Mental Qualities Palatable?

CQ, as I said at the start, is overwhelmingly plausible, and the cost of denying it high—really, about as high as the sheer cost of denying a philosophical thesis can be. Literally taken, epiphenomenalism means we cannot view the screaming and crying behaviour of babies as a direct indication they are in pain. Indeed, the very nature of pain—which we usually think of as a feeling—becomes moot. The ramifications for ethics, personhood—given its association with consciousness—and politics are unthinkable. Moreover, it is likely that those who reject unconscious mental qualities, and the L-R style of argument, have not realised their position embroils them in epiphenomenalism about conscious qualities, and that this consequence will be unwelcome to them. This is a good deal of support, one might think, for positing unconscious qualities.

But, further, as has been noted by Chalmers, epiphenomenalism is a natural pathway to eliminativist positions about mental qualities, such as illusionism.³⁹ The less there is in the world for mental qualities to do, to that extent are reasons for positing them seemingly undermined. So the posit of unconscious qualities is additionally to be recommended for its capacity to block the slide to eliminativism about mental qualities *tout court*.

³⁸ Analogues of the four objections to the argument are open to Prinz and Nanay. I lack space to discuss these, yet it is fairly clear that parallel responses will also apply—due to the shared structure of the cases, with their versions of claims i-iii.

³⁹ Chalmers 2020, Frankish 2016.

Of course, ingenious philosophers have proposed ways to live with epiphenomenalism,⁴⁰ and few are persuaded to ignore the introspective data that conscious mental qualities exist. Nonetheless, the dilemma we have uncovered between the threat of epiphenomenalism for conscious mental qualities and the need to posit unconscious mental qualities is a surprising and significant result, and represents at least a strong, and hitherto overlooked, argument in favour of the existence of unconscious mental qualities.

5. Coda on Consciousness

The preceding discussion raises questions about the role of a mental quality's *being conscious*. If RLS creeping crawling qualities have their effects whether or not the subject feels them, what, if is anything, is added by their being sometimes conscious? A threat to my argument appears to lurk here: I argued that failure to posit unconscious qualities implies epiphenomenalism about (the relevant) conscious mental qualities, which I suggested is too high a price to pay for the thesis that there are no unconscious mental qualities. But perhaps analogous reasoning applies to consciousness itself. If the posit of unconscious mental qualities implies, in turn, that consciousness—that which mental qualities gain upon becoming experienced—is epiphenomenal, that might be seen as too high a price to pay for the thesis that there are unconscious mental qualities. What would result? Nothing good, plausibly some kind of stalemate. If my argument is sound, we would be caught between epiphenomenalism about conscious qualities and epiphenomenalism about consciousness itself. It is unclear how one might go about choosing between these unwelcome alternatives. And perhaps the thesis that consciousness is epiphenomenal would prove sufficiently distasteful as to tempt readers to run my argument backwards, as a *modus tollens* against one of the premises. Perhaps illusionism would receive fresh fuel after all.

Let me offer three responses to this worry. Two grant the charge of consciousness epiphenomenalism, and the third provides a way to reject it—hence is preferable on balance.

Note, first, that consciousness's epiphenomenalism follows only if my argument works. It is my particular way of arguing for unconscious qualities which, according to the

⁴⁰ E.g. Gertler 2019.

objection, threatens epiphenomenalism about consciousness. But if the argument works, it works. So we really *would* be, if the objection is correct, caught between the options of epiphenomenalism about conscious qualities and consciousness epiphenomenalism. Sometimes philosophy leads us to uncomfortable places. That can indicate some fundamental error, but we may need to retrace our steps a long way to find it—perhaps consciousness eliminativism could end up being motivated in this way, say. Or we might just be left in aporia. This is not in itself an objection to an argument. Nor is there a straightforward *tu quoque* here. If consciousness ends up epiphenomenal that does not show it is absurd to think that there are unconscious qualities, since the alternative thesis, that conscious qualities are epiphenomenal, is also very hard to accept. Indeed, there are those who find it more plausible that consciousness is epiphenomenal than that mental qualities are. Rosenthal, for example, argues that consciousness lacks a clear causal role beyond the functional contributions of mental states' 'first-order' contents, which can be conscious or unconscious.⁴¹ This first response, then, bites the bullet hard.

Second, though, there is I think the appearance of a dilemma in this objection but not a real dilemma. That is because the thesis that conscious qualities are epiphenomenal plausibly includes or entails the thesis that consciousness itself is epiphenomenal. For how could x's which are conscious be causally inert and yet consciousness itself fail to be causally inert? If consciousness contributes to an x's functionality at all then conscious x's cannot be wholly epiphenomenal. So, really, *if* my argument works *and* the objection is cogent, we are faced with the choice between the thesis that conscious mental qualities and, *ipso facto*, consciousness, are epiphenomenal, and the thesis that consciousness is epiphenomenal but mental qualities—e.g. pains—are not. If these alternatives differ it is not regarding the thesis the objector considers troublesome, namely the epiphenomenalism of consciousness. Thus it is not as if rejecting unconscious qualities preserves consciousness from the threat of epiphenomenalism; hence there is no special price associated with positing them.

However, third and best, we should not infer from my argument that consciousness is epiphenomenal. Distinguish the *narrow functional role* of a mental quality from its *broad functional role*. Its narrow role is the contribution it makes whether it is conscious or not. Its broad role, by contrast, is the particular total functional role it has when phenomenally

⁴¹ Rosenthal 2008.

conscious. So, as regards creeping crawling RLS qualities, we may say that their narrow role, assuming they exist unconsciously, consists mainly in their propensity to cause PLMs, whether the subject is conscious or wholly unconscious—in possession of no conscious states. With the addition of consciousness—i.e., concerning a creeping crawling quality of which we are phenomenally conscious—its causal role may differ considerably. For instance, consciousness will plausibly enable ‘gatekeeper’ functions, and other cognitive access-style functions, such as the ability to report on the mental quality, something the subject manifestly cannot do when the quality occurs during dreamless sleep. Regarding the gatekeeper function, here is how an RLS sufferer described to me their experience at a dinner party: ‘I felt that horrible feeling and had the strong urge to flex my leg or get up, but I was in company so decided to try to hold off for a few minutes until I could politely go into the kitchen.’ Here it seems that, though the creeping crawling quality is doing its best to prompt leg movement, the subject is able to block this, at least for a time, by virtue of the cognitive access that consciousness of the quality affords, and associated executive control abilities. Indeed, a congenial thesis here is that phenomenal consciousness constitutes the ground of the dispositions, or capacities, associated with cognitive access.⁴²

If this is correct, then if you subtract the narrow functions of a mental quality from its broad functions, you should be left with the same set of functions *whichever mental quality, of whichever type, you consider*. In other words, the contribution of consciousness to the functionality of a mental quality is entirely generic: consciousness makes the same functional addition to any quality qua conscious. So in this way the (broad) functional role of a conscious quality will differ from the (narrow) role of an unconscious quality. And the total physical basis of a quality-plus-consciousness will differ from that of an unconscious quality, for it will include whatever physiology enables consciousness—such as recurrent cortical processing, or higher-order representation. Consciousness is far from epiphenomenal, on this view.

All my argument for unconscious qualities requires, however, is the claim that the narrow functional role of a given conscious quality is the same as that played by the relevant unconscious property. Only if this is false, if the ‘RLS-role’ played by the relevant

⁴² Kriegel 2006, Lockwood 1989: 167. Rosenthal 2008, notably, denies consciousness even this gatekeeper function.

property—the one that prompts PLMs—is significantly different when a subject is unconscious, is there a danger that the physical basis of RLS will not be univocal in consciousness and unconsciousness—threatening, notably, P3 of my argument, much of the subsequent reasoning, and responses to objections. But that the narrow role, and physical basis, of the relevant property remains constant in consciousness and unconsciousness is assumed by researchers in the RLS literature.⁴³ And it is not in tension with the claim that consciousness itself plays a functional role, as we just saw. Hence my overall argument is compatible with according consciousness a functional role, albeit a generic one. But this fits with an appealing view about the function of consciousness in any case.⁴⁴

Acknowledgements

I would like to thank Madeleine Cohen, David Pitt, Jakub Mihalik, Torin Alter, Michelle Liu, Harry Cleeveley, David Rosenthal, Bence Nanay and two anonymous referees for this journal for comments and/or discussion that helped to improve this paper.

Funding Information

This work was funded by Leverhulme Major Research Fellowship MRF-2018-141.

ORCID

0000-0003-0691-8261

References

- Block, Ned (1995) 'On a Confusion about a Function of Consciousness', *Behavioral and Brain Sciences* **18**: 227-247. doi:[10.1017/S0140525X00038188](https://doi.org/10.1017/S0140525X00038188).
- Block, Ned (2008) 'Consciousness and Cognitive Access', *Proceedings of the Aristotelian Society* **108**: 289-317. doi: 10.1111/j.1467-9264.2008.00247.x.
- Bogan, Richard K. (2006) 'Effects of RLS on Sleep', *Neuropsychiatric Disease and Treatment* **2**: 513-519. doi:[10.2147/nedt.2006.2.4.513](https://doi.org/10.2147/nedt.2006.2.4.513).
- Bucher, S. F. et al. (1997) 'Cerebral Generators Involved in the Pathogenesis of the Restless Legs Syndrome', *Annals of Neurology* **41**: 639-645. doi: 10.1002/ana.410410513.
- Chalmers, David J. (1996) *The Conscious Mind*. Oxford University Press.

⁴³ And assumed, importantly, *mutatis mutandis*, by Nanay and Prinz concerning, respectively, mental imagery and emotions.

⁴⁴ Even Block 1995, strictly, only *cautions us not to assume* cognitive access is the function of phenomenal consciousness, rather than arguing flat out that these are two wholly distinct properties. Admittedly, in later work (e.g. 2008) he does argue for inaccessible phenomenal consciousness—but the arguments are controversial, and merit separate discussion.

- Chalmers, David, J. (2020) 'Debunking Arguments for Illusionism about Consciousness', *Journal of Consciousness Studies* **27**: 258-281.
- Chaudhuri, K. Ray et al. (2001) 'Restless Legs Syndrome', *Journal of Neurology, Neurosurgery and Psychiatry* **71**: 143-146. doi: 10.1136/jnnp.71.2.143.
- Clemens, Stefan et al. (2006) 'Restless legs syndrome Revisiting the dopamine hypothesis from the spinal cord perspective', *Neurology* **67**: 125-30. doi:10.1212/01.wnl.0000223316.53428.c9.
- Coleman, Sam (2021) 'The Ins and Outs of Conscious Belief', *Philosophical Studies* **179**: 517-548. doi.org/10.1007/s11098-021-01669-2.
- Coleman, Sam (2022a) 'Intentionality, Qualia, and the Stream of Unconsciousness', *Phenomenology and Mind* **22**: 42-53. doi:10.17454/pam-2203.
- Coleman, Sam (2022b) 'Fred's Red: On the Objectivity and Physicality of Mental Qualities', *Synthese* **200**. doi.org/10.1007/s11229-022-03772-1.
- Coleman, Sam (forthcoming) 'A Feeling Theory of Unconscious Emotions', in Tomas Marvan and Michal Polak, eds., *Conscious and Unconscious States and Processes: Examining their Nature, Similarities and Difference*. Routledge.
- Crane, Tim (1998) 'Intentionality as the Mark of the Mental', in Anthony O'Hear, ed., *Contemporary Issues in the Philosophy of Mind*. Cambridge University Press.
- Ferri, Raffaele et al. (2017) 'Periodic leg movements during sleep: phenotype, neurophysiology, and clinical significance', *Sleep Medicine* **31**: 29-38. doi:10.1016/j.sleep.2016.05.014.
- Frankish, Keith (2016) 'Illusionism as a Theory of Consciousness', *Journal of Consciousness Studies* **23**: 11-39.
- Gertler, Brie (2019) 'Acquaintance, Parsimony, and Epiphenomenalism', in Sam Coleman, ed., *The Knowledge Argument*. Cambridge University Press.
- Jackson, Frank (1982) 'Epiphenomenal Qualia', *The Philosophical Quarterly* **32**: 127-36. doi.org/10.2307/2960077.
- Kim, Jaegwon (1993) *Supervenience and Mind: Selected Philosophical Essays*. Cambridge University Press.
- Kosslyn, Stephen N. et al. (1995) 'The Cognitive Neuroscience of Mental Imagery', *Neuropsychologia* **33**: 1335-44. doi:10.1016/0028-3932(95)00067-d.
- Kriegel, Uriah (2006) 'Consciousness: Phenomenal Consciousness, Access Consciousness, and Scientific Practice', in Paul R. Thagard, ed., *Handbook of Philosophy of Psychology and Cognitive Science*: 195-218. Elsevier.
- Lanza, Giuseppe et al. (2017) 'Central and peripheral nervous system excitability in restless legs Syndrome', *Sleep Medicine* **31**: 49-60.
- Lee, Byeong-Yeul et al. (2018) 'Involvement of the central somatosensory system in restless legs syndrome: A neuroimaging study', *Neurology* **90**: 1834-41. doi.org/10.1212/WNL.0000000000005562.

- Lockwood, Michael (1989) *Mind, Brain and the Quantum*. Blackwell.
- Lycan, William G. (1996) *Consciousness and Experience*. The MIT Press.
- Manconi, Mauro et al. (2007) 'Time Structure Analysis of Leg Movements During Sleep in REM Sleep Behavior Disorder', *Sleep* **30**: 1779-85. doi:[10.1093/sleep/30.12.1779](https://doi.org/10.1093/sleep/30.12.1779).
- Margariti, Persefoni et al. (2011) 'Investigation of Unmedicated Early Onset Restless Legs Syndrome by Voxel-Based Morphometry, T2 Relaxometry, and Functional MR Imaging during the Night-Time Hours', *American Journal of Neuroradiology* **33**: 667-672. doi.org/10.3174/ajnr.A2829.
- Nanay, Bence (2018) 'Multimodal Mental Imagery', *Cortex* **105**: 125-34. doi:10.1016/j.cortex.2017.07.006.
- Papineau, David (2002) *Thinking about Consciousness*. Oxford University Press.
- Pearson, Joel et al. (2015) 'Mental Imagery: Functional Mechanisms and Clinical Applications', *Trends in Cognitive Sciences* **19**: 590-602. doi:10.1016/j.tics.2015.08.003.
- Prinz, Jesse (2005) 'Are Emotions Feelings?', *Journal of Consciousness Studies* **12**: 9-25.
- Rizzo, Giovanni et al. (2017) 'Brain imaging and networks in restless legs syndrome', *Sleep Medicine* **31**: 39-48. doi:[10.1016/j.sleep.2016.07.018](https://doi.org/10.1016/j.sleep.2016.07.018).
- Rosenthal, David M. (2008) 'Consciousness and its function', *Neuropsychologia* **46**: 829-840. doi: 10.1016/j.neuropsychologia.2007.11.012.
- Rosenthal, David M. (2010) 'How to Think about Mental Qualities', *Philosophical Issues* **20**: 368-793. doi.org/10.1111/j.1533-6077.2010.00190.x.
- Rosenthal, David M. (2022) 'Mental Appearance and Mental Reality', in Josh Weisberg, ed., *Qualities and Consciousness*. Cambridge University Press.
- Salas, Rachel Marie et al. (2018) 'Connecting clinical aspects to corticomotor excitability in restless legs syndrome: a TMS study', *Sleep Medicine* **49**: 105-112. doi:10.1016/j.sleep.2018.05.002.
- Searle, John (1992) *The Rediscovery of the Mind*. The MIT Press.
- Siewert, Charles (1998) *The Significance of Consciousness*. Princeton University Press.
- Suzuki, Keisuke et al. (2015) 'Restless Legs Syndrome and Leg Motor Restlessness in Parkinson's Disease', *Parkinson's Disease*. doi.org/10.1155/2015/490938.
- Strawson, Galen (1994) *Mental Reality*. The MIT Press.
- Trenkwalder, Claudia et al. (2005) 'The Restless Legs Syndrome', *The Lancet Neurology* **4**: 465-75. doi:10.1016/S1474-4422(05)70139-3.
- Wakefield, Jerome C. (2018) *Freud and Philosophy of Mind*. Palgrave Macmillan.
- Winkelman, John et al. (2014) 'Restless legs syndrome and central nervous system gamma-aminobutyric acid: preliminary associations with periodic limb movements in sleep and restless leg syndrome symptom severity', *Sleep Medicine* **15**: 1225-30. doi:10.1016/j.sleep.2014.05.019.