The Science of Mental Qualities

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Conscious and Unconscious Mind: Commonalities and Differences
The Czech Academy of Sciences

I. Two Concepts of Mental Quality

- Thomas Nagel's (1974) "What Is It Like to Be a Bat?" did much to convince a generation that mental qualitative character cannot occur without consciousness—so that mental qualities are intrinsically conscious.
- Mental qualitative character, he holds, is simply what it's like for one. So qualitative character cannot occur except consciously, and cannot even be understood except by way of consciousness.

  Many today see no other view of mental qualitative character as even conceivable.

- So influential has Nagel's picture been that consciousness is often now just identified with qualitative mentality—thereby ignoring conscious states of every other type.
- Nagel also sees the subjective character of consciousness—what it's like for one—as precluding any explanation cast in objective terms, such as physicalism or functionalism.
- That's again from seeing mental qualities as intrinsically conscious. But that has an even more troubling result. If qualitative character is intrinsically conscious, not only can we give no explanation of either consciousness or qualitative character—we cannot then even give an informative description of what either consists in.



- That makes a mystery of each—captured by the idea of an explanatory gap (Levine 2001) or a hard problem (Chalmers 1995), and the idea of undetectable quality inversion. No science of these things is then possible.
- But consciousness seems mysterious only if we must explain and describe it within a closed set of terms—for Nagel, what it's like, subjectivity, perspectives, and points of view. The apparent mystery stems from our being unable to connect those things to anything outside the closed family—like W. V. Quine's (1951) closed curve of terms used to try to prop up analyticity.

- This closed conception makes a mystery of both mental qualities and consciousness.

- First-person access relies on the way a state is conscious. But if consciousness is built into mental qualities, nothing can override first-person access. Such access is then detached from anything objective.
- Thus detached, first-person access would be not only the first word about mental qualities, but also the last word about them!
- First-person access can then tell us nothing at all about mental qualities—except that this is what it's like, where 'this' refers to something accessible only to the subject.

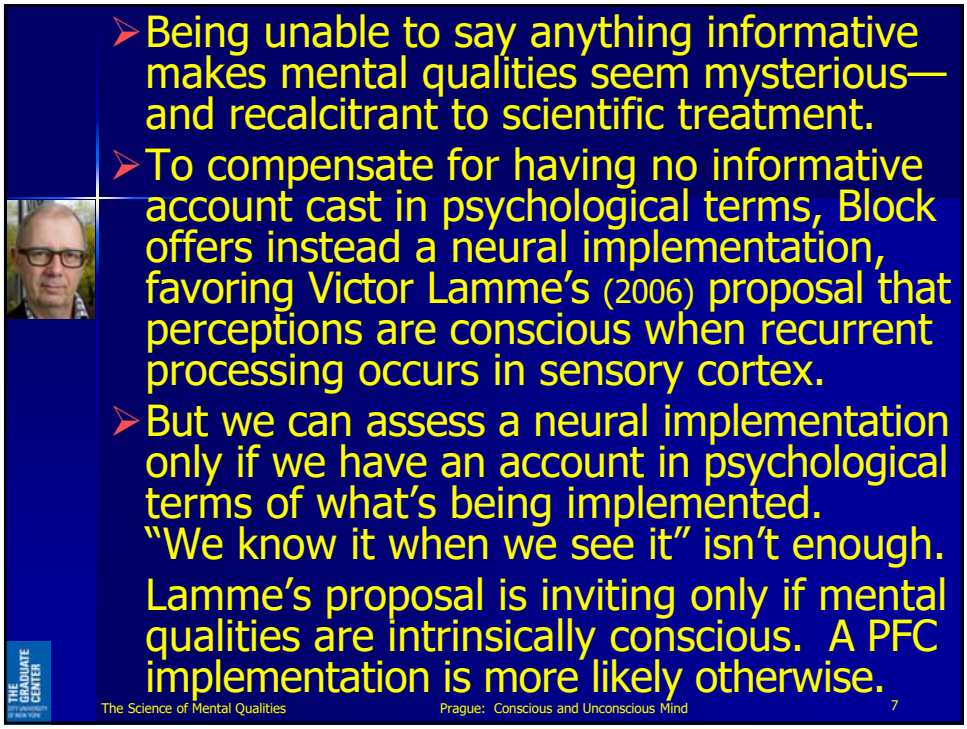
So if we know about the nature of mental qualities solely by way of consciousness, we can say nothing informative about them whatsoever.

- This picture of mental qualities is reflected in Ned Block's widely adopted concept of phenomenal consciousness—on which mental qualities are intrinsically conscious.
- And to his credit, Block acknowledges the consequence of his conception just noted.

We can, he concedes, say little if anything about what conscious qualitative character is beyond Louis Armstrong's famous quip about jazz: "If you gotta ask, you ain't never gonna get to know" (1978, p. 281).

- More recently: "The best you can do is use words to point to a phenomenon that the reader has to experience from the first person point of view" (2015, p. 47).

Point?!? What might that even mean?


Being unable to say anything informative makes mental qualities seem mysterious—and recalcitrant to scientific treatment.
To compensate for having no informative account cast in psychological terms, Block offers instead a neural implementation, favoring Victor Lamme's (2006) proposal that perceptions are conscious when recurrent processing occurs in sensory cortex.
But we can assess a neural implementation only if we have an account in psychological terms of what's being implemented. "We know it when we see it" isn't enough.
Lamme's proposal is inviting only if mental qualities are intrinsically conscious. A PFC implementation is more likely otherwise.
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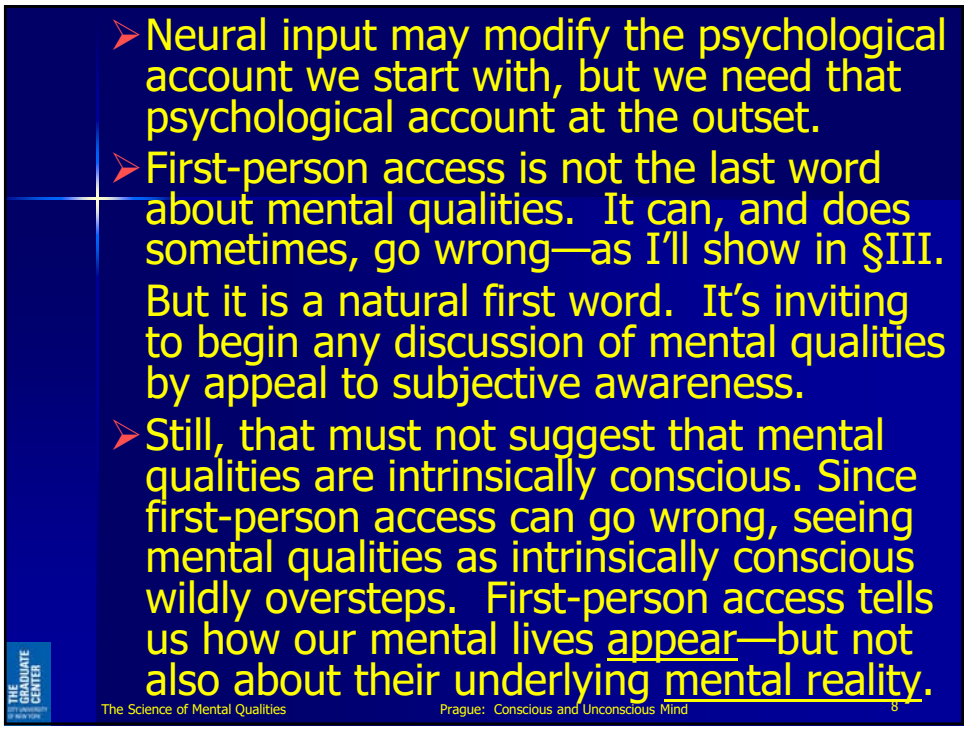
Neural input may modify the psychological account we start with, but we need that psychological account at the outset.
First-person access is not the last word about mental qualities. It can, and does sometimes, go wrong—as I'll show in §III.
But it is a natural first word. It's inviting to begin any discussion of mental qualities by appeal to subjective awareness.
Still, that must not suggest that mental qualities are intrinsically conscious. Since first-person access can go wrong, seeing mental qualities as intrinsically conscious wildly oversteps. First-person access tells us how our mental lives appear—but not also about their underlying mental reality.
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- We can get at that underlying reality only if we supplement the subjective appearances with empirically sound theorizing.
- That's so for the nature of the states we subjectively appear to be in—and also for the psychological mechanisms responsible for those subjective appearances.
- Taking mental qualities to be intrinsically conscious is anti-theoretical, since first-person access then gives us everything there is to get. And precluding theorizing insulates the claim from any challenge.

But there are fruitful ways to theorize both about consciousness and about qualitative character—ways that actually have a strong foothold in intuitive common sense.

- Theorizing about mental qualities usefully begins with the distinctive roles they play in perception—their characteristic roles in discriminating among perceptible stimuli.
- A mental quality of red enables one to discriminate red stimuli from stimuli of any other color; similarly for all other mental qualities and for other sensory modalities.
- The perceptual role characteristic of every type of mental quality is at least as well-entrenched in common sense—and in so-called pretheoretic intuition—as anything about consciousness, likely even more so.

So we needn't conceive of mental qualities as inextricably tied to consciousness. That consciousness-first view is wholly optional.

- We have two ways to conceive of mental qualities: as properties fully revealed by consciousness—or as properties fixed by their role in perceptual discrimination.
- And perceptual discrimination occurs both consciously and not; so that conception is independent of consciousness. So this is a cousin of the compelling dual theory of Tomáš Marvan and Michal Polák (2017, 2019).
- The consciousness-first conception prevents informative explanation; so let's examine and assess the perceptual-role conception.

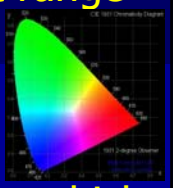
  In §II, I'll argue that it provides us with a sound scientific treatment both of mental qualities and of consciousness. And in §III I'll offer some empirical grounding for it.

II. A Theoretical Account

- Perceiving involves discriminating among the perceptible properties of stimuli—colors, shapes, sizes, sounds, odors, tactile pressure and textures, and so forth.

  And as noted, such discrimination occurs both consciously and unconsciously. It occurs in subliminal perceiving no less than in everyday conscious cases.
- By manipulating stimuli, we can test for just noticeable differences (JNDs)—differences between stimuli so small that if they were physically any closer one would be unable to distinguish them at all.

- We can then use the JNDs for a range of stimuli to construct a quality space (QS) that captures all the stimuli in that range that an individual can discriminate.
- For color stimuli, the QS might be like this (here just hue and saturation): (CIE—Commission Internationale d'Éclairage, 1931).



- This is not multidimensional scaling, which is global and subjective, and so unreliable. It relies on stimuli—which we can control.
- Conscious perceptual discrimination plainly rests on differences in mental quality. We consciously discriminate stimuli by being in conscious qualitative states that differ in ways that correspond to the discriminable differences among perceptible stimuli.

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- So in the conscious case, the QS of discriminable stimuli will also map the conscious qualities that enable one to discriminate those stimuli:

- This gives us a theory—for the conscious case—of what the mental qualities are: They are those properties of perceptual states, mapped by a QS of discriminable stimuli, in virtue of which one can make conscious JND discriminations.
- On this QS theory, mental qualities in the conscious case are fixed by relative location in a QS built on discriminative ability.

But how about unconscious discrimination? Does that also rely on mental qualities fixed by relative location in that type of QS?

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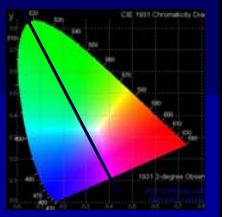
- Mental qualities conceived as intrinsically conscious could not figure in unconscious discrimination. But here we see a decisive reason to reject that conception.
- Conscious discrimination plainly relies on mental qualities—i.e., mental properties that differ in ways that correspond to perceptible differences among stimuli.
- And unconscious perceptual discrimination must also rest on mental properties whose differences correspond to unconsciously discriminable differences among stimuli.

  Those properties are the mental qualities in the conscious case. What could lead one not to see them as such in the unconscious case? Arguably, only anti-theoretical bias.

- And if mental qualities were not responsible for unconscious discrimination, some other properties would be—perhaps subpersonal.

  Those other properties could then also be operative in the conscious case as well—making conscious qualities altogether idle.
- There is also empirical evidence that mental qualities do occur without being conscious, which we'll examine in §III.
  But for now, note that on QS theory the apparent mysteries noted earlier vanish.
- We can now trace explanatory ties between neural states and mental qualities—seen as independent of consciousness.
  Obstacles would still loom only if mental qualities were intrinsically conscious.

- And on QS theory, undetectable inversion of mental qualities is literally inconceivable: If there were an axis around which a QS were symmetrical, stimuli on the two sides would have identical relative locations, and so be indistinguishable.



- And inversion around an asymmetric axis would be detectable. So on QS theory one cannot even conceive of an undetectable inversion of mental qualities—a nice result.
- Since mental qualities are not intrinsically conscious, we must explain how it is that some qualitative states are conscious and others are not. It must be extrinsic to the mental qualities—but how does that work?

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- We must explain consciousness by appeal to psychological phenomena—but ones that are not themselves conscious, since that would be circular. That's the strategy of higher-order (HO) theories.
- If one is in some mental state—e.g., one thinks or perceives something—but one is wholly unaware of doing so, that mental state is not conscious.
  This commonsense folk-theoretic platitude governs most experimental investigation.
- And it's equivalent to a necessary condition for a state to be conscious: One must in some way be aware of the state.
  I've called this the transitivity principle (TP), and it's endorsed by all HO theories.

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- TP gives us a necessary condition for a state to be conscious—but not sufficient. But we can close in on a sufficient condition if we determine in what way one is aware of a state when that state is conscious.
- One constraint: The HO awareness (HOA) must not rely on conscious mediation, e.g., an inference one is aware of. It can't be that I simply believe what you tell me.
- Also, HOAs are rarely conscious, since that would require a third-order awareness—which is itself rare. That avoids circularity. We know about HOAs not by first-person access, but as theoretical posits that do a good explanatory job in distinguishing conscious from unconscious mental states.

- And a HO theory of consciousness fits well with QS theory. Taken together they avoid construing mental qualities as intrinsically conscious, while also explaining what it is for a state to be qualitatively conscious.
- On the combined theory, HOAs represent the mental qualities that figure in a state's being conscious in respect of their relative location in the relevant quality space. HOAs represent the states in QS terms.
- And this actually reflects common sense: When we describe what it's like to have a particular qualitative experience, we typically compare it to others currently available or to characteristic experiences we all have of familiar objects.

- This last is crucial. Those who see mental qualities as intrinsically conscious also claim that they're atomic in nature, and so reject the comparative account of QS theory.
- But mental qualities will seem atomic only if we have access to them only by way of consciousness. Once we take into account their role in perception, their comparative nature becomes evident—indeed, salient.
- And again: That comparative nature figures in the way we are subjectively aware of mental qualities.

  We are always aware, and can readily describe, our conscious qualitative states in respect of comparisons with other states and with relevant stimulus conditions.

- In a phenomenal sorites, A and B can be subjectively indistinguishable and also B and C, but A and C are readily distinguishable. How can that happen if mental qualities do reflect subjective indistinguishability?
- B elicits one mental quality when compared with A and a distinct one when compared with C. The mental quality each stimulus elicits depends on its comparative context.

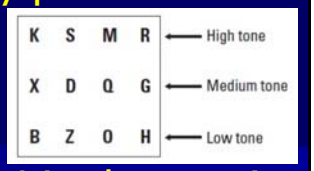
  Subjective indistinguishability is not transitive—as many have noted—
  and QS theory nicely explains why it isn't.
- It would seem transitive only if one thought the nature of mental qualities is revealed solely by consciousness, so that their nature is not comparative, but atomic.

III. Some Scientific Grounding

- An informative science of mental qualities, cast in distinctively psychological terms, is possible only if their nature is not accessible solely by way of consciousness.

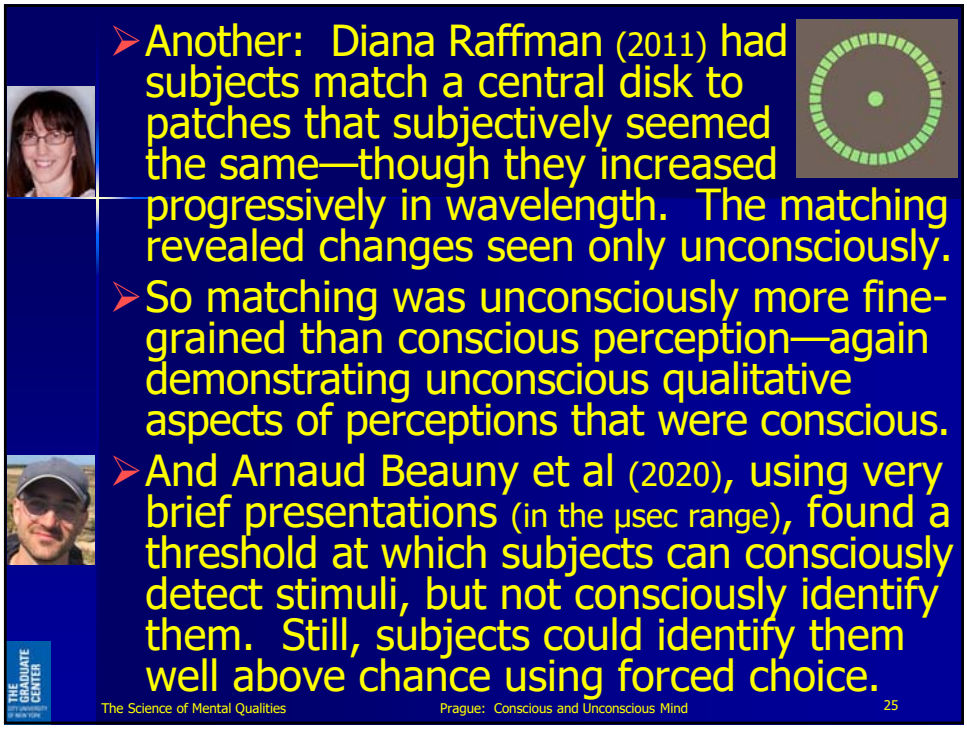
  So it will help if there are empirical findings that support the occurrence of mental qualities independently of consciousness.
- One type of empirical support involves showing that even when a qualitative state is itself conscious, there is sometimes some distinctively qualitative aspect of that state that fails to be conscious.

- George Sperling (1960) briefly presented subjects with a matrix of letters. After they vanish, subjects could identify only 3-4. But if a row is cued after vanishing, they get 3-4 in that row!



- Since any row could be cued, subjects must have retained most identities. But how?

  Block (2007) thinks subjects retain identities consciously—and that such phenomenal consciousness overflows cognitive access.
- But that doesn't work. The letters are conscious, but not most of their identities. The identities are qualitative—but they are an unconscious aspect of the state. What overflows is unconscious (Cova et al, 2021).


Another: Diana Raffman (2011) had subjects match a central disk to patches that subjectively seemed the same—though they increased progressively in wavelength. The matching revealed changes seen only unconsciously.
So matching was unconsciously more fine-grained than conscious perception—again demonstrating unconscious qualitative aspects of perceptions that were conscious.
And Arnaud Beauny et al (2020), using very brief presentations (in the μsec range), found a threshold at which subjects can consciously detect stimuli, but not consciously identify them. Still, subjects could identify them well above chance using forced choice.
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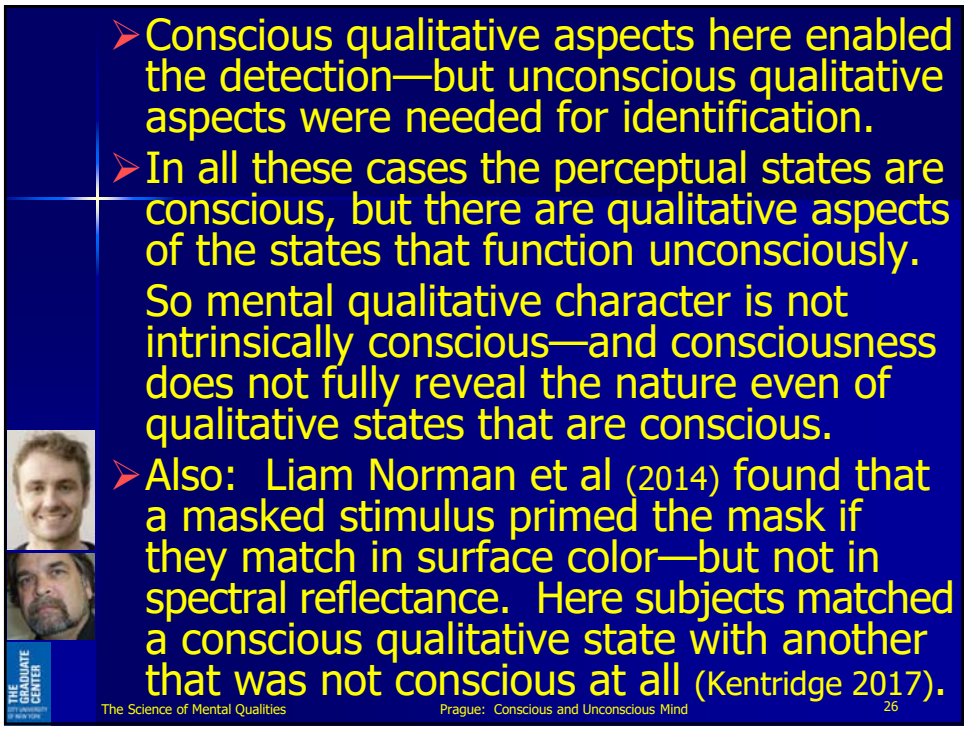
Conscious qualitative aspects here enabled the detection—but unconscious qualitative aspects were needed for identification.
In all these cases the perceptual states are conscious, but there are qualitative aspects of the states that function unconsciously.
So mental qualitative character is not intrinsically conscious—and consciousness does not fully reveal the nature even of qualitative states that are conscious.
Also: Liam Norman et al (2014) found that a masked stimulus primed the mask if they match in surface color—but not in spectral reflectance. Here subjects matched a conscious qualitative state with another that was not conscious at all (Kentridge 2017).
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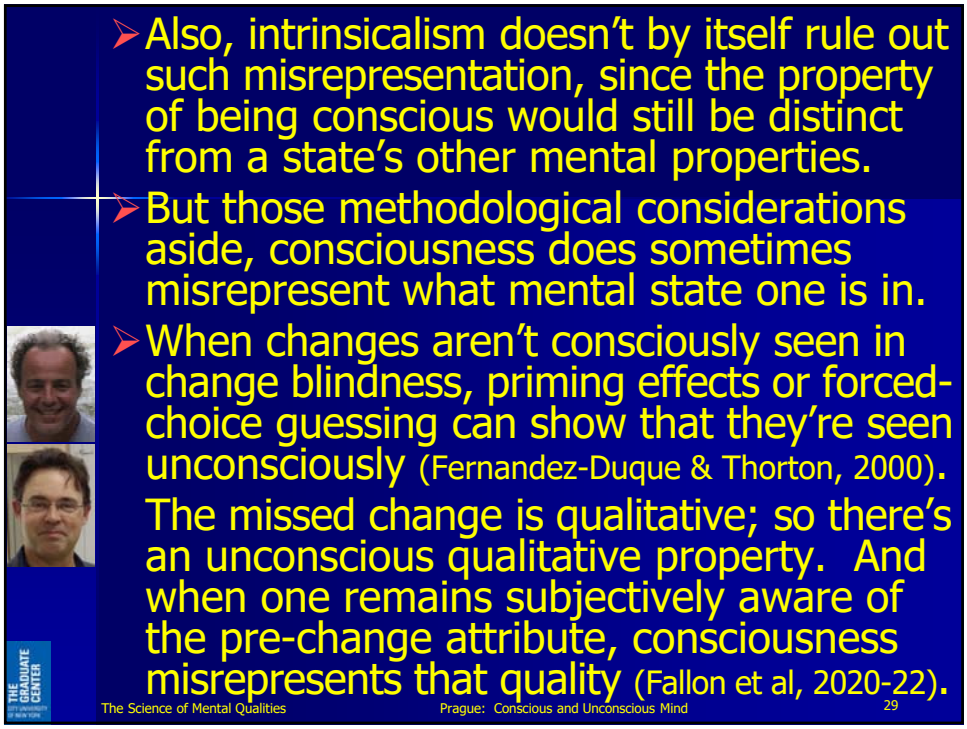
- An advocate of intrinsic consciousness might urge that those unconscious aspects are not genuinely qualitative.
  But the examples are all plainly qualitative: shapes of letters, fine-grained shades of color, a masked color, and qualitative properties needed to identify stimuli.
- So qualitative states can be conscious in respect of some of their qualitative mental properties but not others.
- This doubtless also occurs outside the lab: We consciously see something—but don't consciously see some qualitative aspect that nonetheless influences our behavior.
  That qualitative aspect must have been an unconscious property of the perception.

- And this all is readily accommodated by TP. A state is conscious only if one is aware of it. And the state is conscious in respect of just those properties one is aware of the state as having. TP applies to states in respect of various mental aspects.
- If a state's being conscious is an extrinsic property of that state, as on a HO theory, consciousness might misrepresent a state that one is subjectively aware of.
- Advocates of intrinsic consciousness have seen this as a decisive refutation of HO theories: How could consciousness misrepresent in that way?
  But if one did hold it can't, one could save a HO theory by just adding that stipulation.


Also, intrinsicalism doesn't by itself rule out such misrepresentation, since the property of being conscious would still be distinct from a state's other mental properties.
But those methodological considerations aside, consciousness does sometimes misrepresent what mental state one is in.
When changes aren't consciously seen in change blindness, priming effects or forced-choice guessing can show that they're seen unconsciously (Fernandez-Duque & Thorton, 2000).
The missed change is qualitative; so there's an unconscious qualitative property. And when one remains subjectively aware of the pre-change attribute, consciousness misrepresents that quality (Fallon et al, 2020-22).
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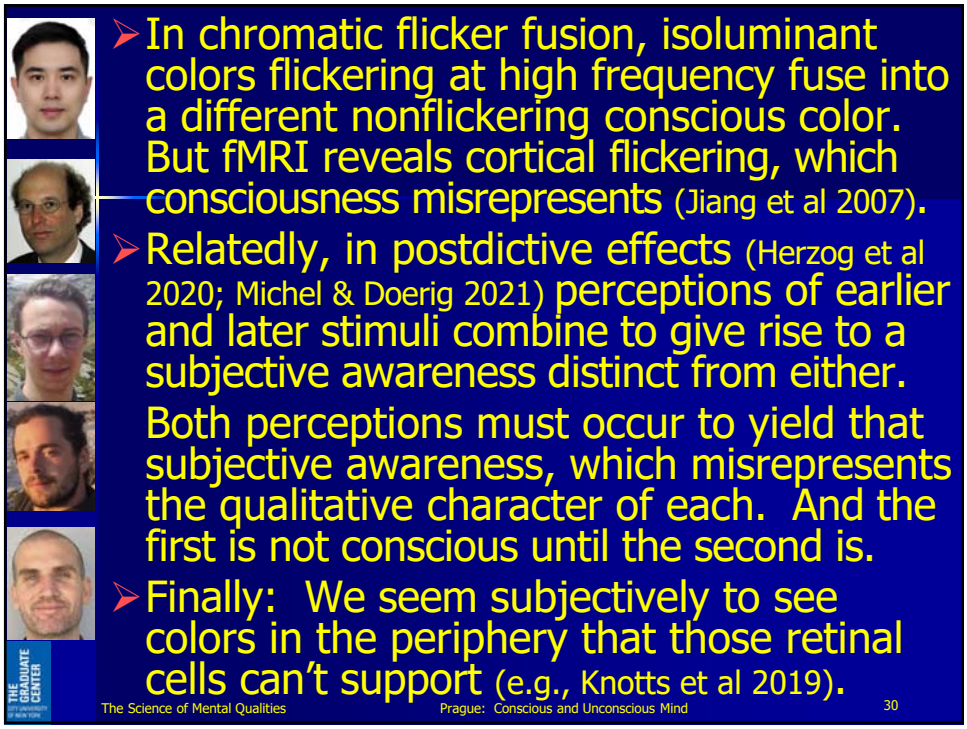
In chromatic flicker fusion, isoluminant colors flickering at high frequency fuse into a different nonflickering conscious color. But fMRI reveals cortical flickering, which consciousness misrepresents (Jiang et al 2007).
Relatedly, in postdictive effects (Herzog et al 2020; Michel & Doerig 2021) perceptions of earlier and later stimuli combine to give rise to a subjective awareness distinct from either.
Both perceptions must occur to yield that subjective awareness, which misrepresents the qualitative character of each. And the first is not conscious until the second is.
Finally: We seem subjectively to see colors in the periphery that those retinal cells can't support (e.g., Knotts et al 2019).
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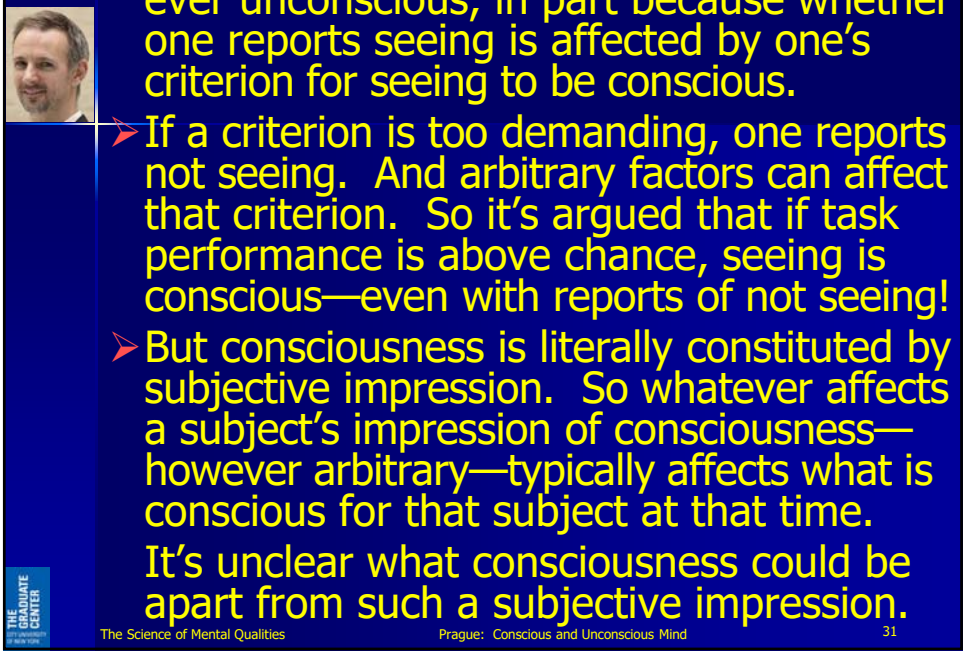
Ian Phillips (2018) denies that perception is ever unconscious, in part because whether one reports seeing is affected by one's criterion for seeing to be conscious.
If a criterion is too demanding, one reports not seeing. And arbitrary factors can affect that criterion. So it's argued that if task performance is above chance, seeing is conscious—even with reports of not seeing!
But consciousness is literally constituted by subjective impression. So whatever affects a subject's impression of consciousness—however arbitrary—typically affects what is conscious for that subject at that time.
It's unclear what consciousness could be apart from such a subjective impression.
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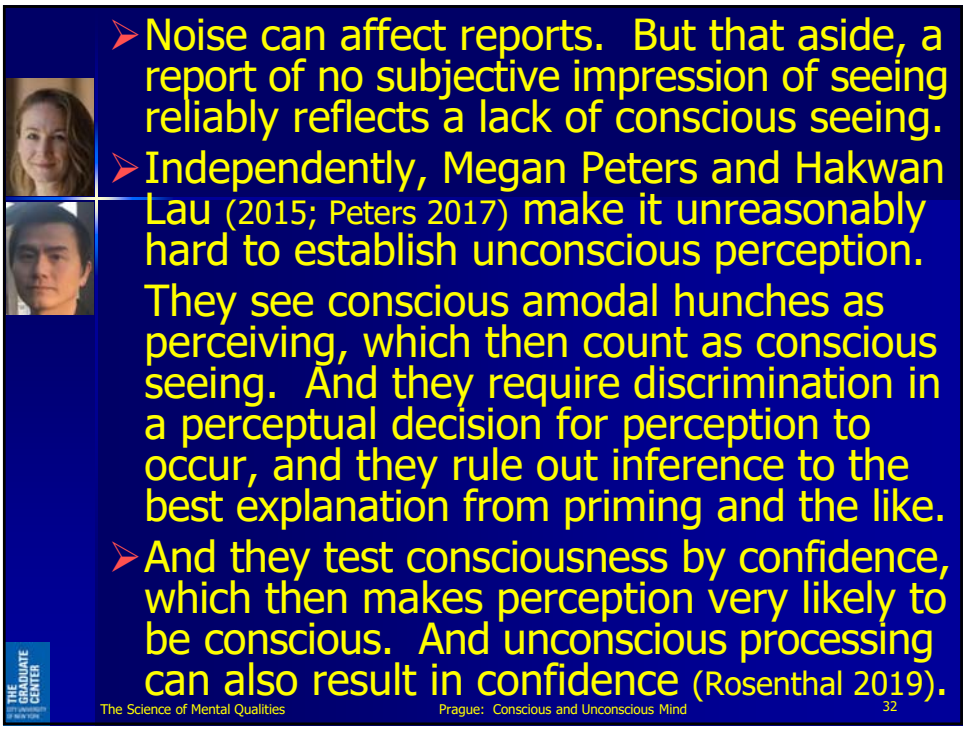
Noise can affect reports. But that aside, a report of no subjective impression of seeing reliably reflects a lack of conscious seeing.
Independently, Megan Peters and Hakwan Lau (2015; Peters 2017) make it unreasonably hard to establish unconscious perception.
They see conscious amodal hunches as perceiving, which then count as conscious seeing. And they require discrimination in a perceptual decision for perception to occur, and they rule out inference to the best explanation from priming and the like.
And they test consciousness by confidence, which then makes perception very likely to be conscious. And unconscious processing can also result in confidence (Rosenthal 2019).
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Concluding Remarks

- A science of mental qualities requires theoretical accounts both of the mental qualities themselves and of consciousness.
  I've proposed the joint QS and HO theory. But how does that fit with the mental appearances of qualitative consciousness?
- Some see those mental appearances as all there is to the mental reality of conscious qualitative properties.
  Thus Nagel: "The idea of moving from appearance to reality seems to make no sense" for conscious experiences (p. 444).
  What should we make of this claim?

- Consciousness is the way our mental lives appear to us subjectively. But those mental appearances by no means exhaust the objective mental realities of consciousness.
  There is also (1) the mental reality of the states and properties that subjectively appear to us, as well as
  (2) the mental reality of the occurrences that implement the appearing itself.
- For qualitative consciousness, the mental qualities are the mental realities that subjectively appear—the mental realities that are subjectively like something for one.
- But there is, in addition, the subjective appearing itself—which has its own objective mental reality.

- All appearing is implemented by something objective. It doesn't subjectively seem so for consciousness, but the subjective appearances would not reveal that, and it's question begging to be thus restricted.
- And there are mental mechanisms that do implement the subjective appearings of consciousness—an objective mental reality.
- The theories I've proposed address both aspects of the objective mental reality of qualitative consciousness.

  QS theory covers the mental reality of the qualitative states that subjectively appear, and a HO theory explains the objective mental reality for the subjective appearings themselves (Rosenthal 2022).

Thank you for your attention


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