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Neuroscience, Qualia, and Representationalism
a.k.a.
Nothing More Than Seeming

Part of the controversy in philosophy of perception as I see it centers around what is represented with regards to the "representation" and "phenomenism" debate and how these influence what one would want to say about "qualia". I feel that a large portion of the confusion centers around what exactly is represented by the brain when it has received "sensory input." Philosophers generally have ignored what is known here and are still relying on what appear to be outmoded notions on (neural) representation, particularly when it comes to representation of non-propositional facts. In this paper I sketch out some of is known about what is represented by the brain when it one is looking at, say, a puddle of water (or twater?). This will allow a beginning of a cutting of the gordian knot around qualia.

Hence I will have four sections to this paper. First, there will be a brief summary of the internalism/externalism divided and the representationism vs. phenomenism debate as I see it. The second section will contain a very brief overview of what is known about the brain's representation of the external world, particularly in the context of vision. Third, the paper will contain a discussion of the two senses in which qualia has been used in the literature. One sense will turn out to neurologically implausible. The second sense is acceptable - I will not argue for this explicitly, except by saying that if one wants to continue to use the word, one better not use it the other way. (This noncontroversial sense will turn out to be Locke/Boyle's account of secondary properties[1].) We shall see how the other sense is neurologically (actually, materialistically) absurd. The paper will explain why this is so. Fourth, the paper will then conclude by a methodological note to philosophers which can be extracted as a moral from the preceding discussion.

Section 1 - Internalism vs. Externalism; Representationism vs Phenomenism

The way I read the philosophy of perception literature is that all philosophers working in this area are externalist with regards to mental states. All of them believe that in some way, the states of the world external to one's mind[2] are somehow relevant to understanding one's mental states. I agree with this thesis, however, I do not feel that the way that the "externalism" thesis is expressed is productive.

One must instead take into account that the way the world appears to a subject is equally a function of the world at large and her internal constitution at that particular time. This is important, because it stresses what has been overlooked by some philosophers. It may not be directly relevant to "twin earth" examples, but there are (as we shall see in the next section) many different ways in which the visual system is not as autonomous as is commonly held.

On the other hand, the phenomenism contra representationism debate (see Block 1996) is even more confused. In Block's (1996) paper on (among other things) orgasms (and the work that has been produced in response), we have the debate over whether the phenomenal character of an experience is exhausted by its representational character. Several definitions of representational and phenomenal are argued over. For instance, representationism (according to Tye 1996) is the thesis that a given piece of mental content is representational and does not contain any qualitative features over and above this. (The underlying part is crucial, as the representationalists are not denying the apparent qualitative features[3].) The various partisans argue back and forth because these definitions are inadequate because none of them pay any attention to brain functioning. I move that here we need some investigation into what is actually represented by the brain in some non-controversial sense, which is the next section. As we shall see, the various philosophers in this debate have failed to distinguish between what seems to be the case and what is the case.

Section 2 - Representationalism and Neurology

I will argue below that this (the seeming vs. the being - see above) should be taken as far as the best science will tell us, and that relying too much on introspection and what might be called "pop" or "folk" psychology is doomed to get one caught up either in contradictions or in impasses. I have become aware of several very important neuroscientific and psychophysical

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1 It does not matter for the purposes of the present paper which account one adopts. Boyle's account is subtly different from Locke's and one can have a "modern version" of either of the two versions of the thesis. All are equivalent herein.

2 I am speaking somewhat loosely on purpose, in order to accommodate the dualists or objective idealists (if there are any left around) at least this far. As we shall see later, however, my resolutions of some of the debates in philosophy of perception are going to require a materialist ontology. I am of the opinion that we must look to science in part to understand perception, and that means adopting a scientific ontology. (See Bunge 1977 for reasons why other kinds of ontologies are incompatible with science.)

3 Arguably, the debate is actually over the word "apparent" (and ones like it) I have used here. We shall see more on this later.

discoveries that absolutely must be taken into account when discussing the philosophy of perception. Many of these center around vision; this paper will primarily focus on the philosophy of vision as that is the most developed sense philosophically and scientifically. Also note that these are just provided as data to be used in the representationalism debate and (by extension) the qualia debate. If some of these are not quite the "intuition pumps" individually as I had hoped, I believe taken together they should shake some of the prescientific cloud surrounding "representation" in the philosophy of perception.

I shall mention the list then discuss why each is relevant to philosophy of perception in turn very briefly. One of these facts has already been pointed out fairly recently by Michael Tye (Tye (?)). He attempted to philosophical attention to the "what" and the "where" visual pathways in primate nervous systems. Another is the issue of peripheral vision and saccadic eye movements, which has been pointed out somewhat by Dennett (1991). A third feature, noted particularly by the Churchlands (1998) is the inputs to the visual system from various nonvisual systems, particularly from the limbic system and the other sensory modalities (notably from the auditory system). A fourth concerns the importance of training when it comes to visual neuron functioning (Sekuler and Blake 1994). Finally, I shall mention briefly the issue of detection of "colour" by non-visual means (Dennett 1991; Sekuler and Blake 1994). A warning, however, concerning the last two. It is not clear at this time to what degree these discoveries bear on human vision; if they do even slightly, they ought to cause some revision of accounts in the philosophy of perception literature (and indeed, of course, in the scientific context as well.)

First, then, a discussion of Tye's account. Tye focuses on a discussion of the anatomical divide between the "what pathway" in the brain and the "where pathway". He draws philosophical attention to this in the interest of dealing with objections to the idea of "mental imagery". He points out three interesting things for our present purposes. These are: one, that because the "what" and the "where" are anatomically distinct our "visual field" and all the things that some have claimed "are in it" is less unified than it appears. Second, due to the fact that we know the parts of the brain used in visual imagery are also parts of the brain involved in spatial perception (Medin and Ross 1997), objections to the "picture" account of imagery also apply to vision itself. (In particular the argument from indeterminacy is especially important. This argument basically is that mental images cannot be like pictures because they do not represent certain key features of objects that we would think would be "in a picture".) This may seem strange at first, but as we shall see, there is reason to doubt the "integrated" nature that the visual field appears to us to be. Hence it seems plausible that we do not in fact explicitly represent everything in our field "snapshot style" despite the appearance that this is the case. Third and finally, Tye brings to our attention another possible way brains could potentially be using to represent visual data. This is the pixel-list fashion. I actually do not know how plausible this is, given how little of the potential visual space is actually in use at any given time. Nevertheless, it tells us of another method of representation, a sort of "digital" or "numerical" way, rather than a propositional/descriptive way or a snapshot/picture way.

Second, we should look at the importance of saccadic eye movements and peripheral vision. Saccadic eye movements are just the little "jumps" the eye takes all the time to bring various parts of the outside world into focus. We do not normally notice these, as it appears to us that we are "presented" with a uniform, completely coloured, well defined in terms of shapes, "visual field" which appears to surround our head. Dennett (1991) has forcefully pointed out that this is in an important sense an illusion brought about by the constant movement of our eyes. He describes an ingenious demonstration that one can try oneself to demonstrate this fact, which I have adapted slightly (after remarks in Sekuler and Blake 1994) and reproduced below to emphasize that philosophy of perception is sterile without serious empirical investigations.

The demonstration[4] proceeds as follows. Take a deck of playing cards, and shuffle well. Take one card from the top of the deck and turn it up away from you at arms length. Without exposing it to yourself, rotate one's arm containing the card so that it is 90 degrees or so from the center of the eyes. Turn the card inwards so that its face is in the direction of one's head, while fixating ahead. Ask yourself whether you even "think" there is a card there. Many people, including the present author, despite their knowledge of the peripheral vision system, were shocked to find that part of their brain was "saying": "I don't know what is out there. It isn't a card. I can't tell that." Observe carefully one's inner reactions for "views" like that, and finally, slowly, bring the card towards the center. Notice that it takes a while even before the card takes on a **shape** (that is, many people report seeing that "there is something there, I know not what" at some point early on. Only later does the card appear to take on shape, followed in turn by colour and only quite near the center does it appear to take on an identity (as, e.g.: the four of diamonds.) This demonstration is striking even if one is used to the effect from previous demonstrations like it. The present author has done it many times and has been surprised every time.

[4] I encourage the reader to take time to do this, as it is really quite striking. Simply saying "oh, yeah, I know what happens in peripheral vision" is not enough.

There are three philosophical lessons to be learned here. One is, as was stated previously, the danger of introspection, and related to that the value of testing hypotheses, even if it appears "just obvious" (to use Frank Jackson's phrasing) that something is the case. A second, slightly different lesson is the direct importance of the concept of **seeming**. This goes beyond the recognition of the necessity of hypothesis testing but to the point of a bit of humility. The third lesson and most important one is the findings themselves. These suggest that the kinds of things that appear to be mentally represented, even in an externalist frame work, are very unlike (in some sense) what they appear to be.

The next point concerns the non-visual inputs to the visual system. The Churchlands (1998) point out that there are many non visual inputs to the visual input that do influence what is literally seen. For instance, the auditory system can affect what is seen. People watching movies where the audio is of one speech and the video of someone saying something else report seeing the appropriate lip movements under certain conditions. This tells us that the representational content (whatever it may be) of vision does go beyond the visual realm. Other connections include some from the limbic system (making what one sees partially a function of one's emotional state). There are even some connections to the visual systems that directly affect what is seen which the best neuropsychologists do not understand at all.

The important lessons here are some specifics over additional features that the visual system represents (so to speak) and that we are not directly aware of.

Another important issue for discussions over representationalism concerns the possible importance of making sure the visual system (or presumably the systems of other sensory modalities) gets appropriate stimulation early in life. Monkeys raised with only horizontal (vertical) bars in their environment have trouble developing a sense for vertical (horizontal) bars (see Sekuler and Blake 1994). As remarked above, it is not known whether this effect applies to humans or to what degree. (I would hazard a guess that it applies less, as the human nervous system is more capable than monkey nervous systems in terms of self reorganization (neuronal plasticity)). Assuming it is true to any degree, it is important for the representationalism debate as what is represented also is a function of a person's development. The particularly extreme case of this example should not be taken as implying that there are not weaker senses in which situations like this could arise.

The final representational issue concerns cross-modality representation in another respect. I mentioned previously that non-visual systems synapse on to parts of the visual system; the present subsection will consider an interesting specific case of this of sorts. While this case does not involve visual experience in any normal sense, it does involve colours. There is much literature about how colours (particularly ambient colours) affect galvanic skin responses and "feelings of uneasiness" or "feelings of pleasure". For instance, red light generally causes people to be uneasy and some what aggressive. This is even more marked in other primates. (There is in fact a good evolutionary reason to suppose that this would be the case. Red light is the approximate colour of dusk and dawn in the African jungle; most predators of (e.g.) chimpanzees are active at this time. It is not clear whether this anxiety is learned or innate in the cases of either chimpanzees or humans.) This response actually occurs in the absence of some higher order visual systems; people with visual cortex largely destroyed can make this discrimination.

For those who want to think that red has qualitative content over and above a representational content of the ambient light reflectance/absorption (etc.) has to take into account this sort of fact. While it may appear that I am in fact providing ammunition to the phenomenists by telling them about another "feel" associated with colour vision, the exactly opposition conclusion is warranted. As was pointed out by Harman, what good is a quale that one is not aware of? (By definition, we are supposed to be aware of them.) We are not aware that we are slightly less at ease (and so on) in red light. Hence it appears there is something that one would want to say is a quale on some grounds but clearly is not in the normal sense because one isn't aware of it. See the next section for more.

With these in mind, we can now turn to qualia in its two senses and see whether they are possible candidates for something that goes beyond the sense of representational I have sketched here.

Section 3 - Qualia

So, if we return to the example I mentioned in the introduction to this paper, what goes on in the brain when someone looks at water? This, as we have seen, is not a straightforward question. Here we must take into account much of the person's history. Are they thirsty? Tired? In red light? Seasick? These will affect what is represented and the seeming. This seeming is often taken to be the "quale" of the experience.

But, as Dennett (1991) has pointed out, this term ("qualia") is probably the most misunderstood term in the philosophy of mind and perception. It is used by some (e.g.: Bunge 1999) to mean secondary property in the sense of

Locke's usage. It is used by others (e.g.: Block 1996) to suggest something slightly spooky. I put it this way, because it is very difficult to pin down exactly what the "qualiophile" means by her use of the word[5]. (I use the term to mean anyone who thinks that there are qualia in the stronger sense.) Visual qualia, for example, are said to be the "least bits of visual experience", "conscious seeings" - in other words, things like colours, (phenomenal) luminances, etc. But putting it that way just makes (as Plato would say) the many of out of the one. Qualia are also called "sensa", "raw feels" (which is strange, because it is said there are visual and audiotory qualia) and various other things.

Since colours are a favourite group of qualia to talk about, I shall follow the tradition and talk about them as well. As remarked in the discussion of the issue of representation, above, there are many aspects of the visual system that we are not directly aware of and yet influence what might be called qualia. At first glance that appears self-contradictory, but let us play along for a while. Suppose the qualiophile says: "Look here, you've talked about the unconscious parts of my colour experience; I'm talking about those things that are part of my conscious visual experience." Fair enough. What are they? Well, I have shown that they cannot quite be colours as they appear, as what we take to be colours are in fact not simple at all, but strongly influenced by all kinds of conditions. If she says to us next: "Like that <u>blue</u> patch over there that I'm seeing. That's a quale!" we can put her in the fMRI[6] or some other neuroimaging machine and determine what it is she is picking out.

But if she continues to deny these "functional" explanations, our qualiophile has to point inwards and say that <u>this</u> is what she means. Since that very quickly yields to what Wittgenstein (1958) called a "wheel that plays no part in the mechanism", a popular move has been to assert that qualia are epiphenomenal. This word also comes in two meanings. The weak sense is no help to the qualiophile, as it simply means a by product of functioning. My computer's noise (caused by the fan) is such an epiphenomenon as is my shadow an epiphenomenon produced by my height and the ambient lighting conditions. So suppose that qualia were epiphenomenal in that sense? What would go beyond simple representation there? They would (presumably) be brain processes of no particular function - it would be very strange to suppose that these are the things desired by the qualiophile. There is also a stronger sense of epiphenomenal, which means "having no influence on the material world whatsoever". Even if one wants to be a dualist, this stronger sense is absurd. As Dennett points out, this is much too strong a notion, for if one's qualia were epiphenomenal in this sense, they would not make any difference to one's behaviour or brain functioning whatsoever. If one somehow "lost" one's qualia, one would keep on talking as if one did and so on. There would be no way to tell (even introspectively[7]) that one had lost them. Note that this argument works even if one is a dualist, as presumably the dualist has to subscribe to some form of interactionism, at least to explain the movement of one's mouth and larynx when speaking and so on. Then we can play an even stronger form of Wittgenstein's card and commit the idea of the strong sense of qualia to the trash.

What happens to the account of the phenomenist on this understanding of qualia, then? Well, the phenomenist is reporting to us how things seem to her. Since very often what <u>seems</u> to be the case is not the case (as we have seen above), it does <u>seem</u> that certain experiences (orgasms, seeing "red") have phenomenal character that out run representational content. I do not deny this - but I do deny that it is anything more than a <u>seeming</u>.

So what is a <u>seeming</u>? Well, this is again a piece of shorthand. It describes all the tendencies of the person to behave outwardly based on what is represented. (This does not commit us to any sort of nasty behaviourism, as we are taking full account of what is going inside the person's head.) A judgement of the form "X is some colour C" is a seeming. But one should notice that these judgements are dependent on at least three distinct systems in the world. Namely, they are dependent on the object, dependent on the prelinguistic discrimination centers in the brain and the linguistic production system. The latter is extremely important, as this stage in the chain may often be in error. We commonly take a person to be infallible about her own "mental content". But we have seen that this is a mistake. Anywhere on the chain there can be misrepresenting. How does this occur? Our brain often represents what "it is looking for" (for instance: a hunter whose brain is going over and over to itself "deer deer deer" often shoots something else because a partial representation of something that is not a deer gets "amplified up" to a deer.) or sometimes even what it wants to avoid. The latter case is typical of students who worry about examinations. They sometimes want to avoid an exam and wind up seeing it everywhere, even in dreams.

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5 I had the interesting experience of arguing with a Buddhist once who insisted that (a) there were qualia in this sense, and (b) they refuted materialism. Insisting that I didn't know what he was talking about eventually drove home the point that there perhaps are not any such things. I will use a version of this "trick" later.

6 "fMRI" is the abbreviation for "functional magnetic resonance imagining", a popular brain imaging technique used in cognitive neuroscience.

7 If one could somehow tell, one could then "tell oneself" that they were gone. But that can't be done as *ex hypothesi* all brain activity and behaviour is not affected by them.

An objection I must counter concerns the use of the word "supervenience". Some phenomenists may claim that their qualia "supervene" on the brain or some such story. I recognize this objection, however, it turns on replacing the obscure by the more obscure. If "come out as emergent properties", I may very well agree, as this collapses in to the sense of qualia which I think is defensible. If the qualia are supervenient in any of the other popular senses (see Bunge 1999), I am not convinced they are possibilities open to a materialist. Since we have remarked that science requires an ontology of materialism (Bunge 1977), without more support a claim of supervenience in this sense begs the question against the neuroscience based account I have sketched.

We have now seen what sense we can get out of the word qualia. Either "qualia" has no extension[8], or it means something like a summary of a seeming[9].

Section 4 - Methodological Lesson

Philosophers should learn two lessons from all of this. One is the lesson concerning phenomenism and representationism, which has been the main point. This is actually a specific case of the "if you are going to argue about a matter of fact, provide empirical evidence of the relevant kind. (In the case of philosophy of mind and perception, data from neuroscience.) Cogent argument alone is insufficient."

The second lesson is a little less far reaching, but is important nonetheless. As mentioned briefly in section three, "qualia" are occasionally defined as "secondary properties" (usually something like the way Locke conceived of them) as well as in the way I have (hopefully) discredited. The lesson here is simply to avoid using the same word to mean two different things and to brush it under the rug. I do not have time to get into this point in any great detail, but I think part of the confusion over qualia could have been avoided if philosophers had stuck to one meaning or the other.

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8 We cannot say that "qualia" does not denote, because that would entail that I could not have written this paper about them.

9 I should remark in passing that this "account" of colour qualia fits in with the relational account of colour I presented in Douglas 1999.